

*December 1933*

# TECHNOLOGY REVIEW

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# technology review

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in which tobacco is used  
the cigarette is the  
mildest form

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# Chesterfield

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THE TECHNOLOGY REVIEW, December, 1933. Vol. XXXVI, No. 3. Published monthly from October to May inclusive and in July at 10 Ferry Street, Concord, N. H. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription \$3.50; Canadian and Foreign subscription \$4.00. Entered as second-class matter at the Post Office at Concord, N. H., under the Act of March 3, 1879.

## THE TABULAR VIEW

IN its April, 1932, issue, The Review presented an article by Henry Norris Russell of Princeton University entitled "The Master Key of Science — Revealing the Universe through the Spectroscope." This much-reprinted paper (it reappeared this fall in the Annual Report of the Smithsonian Institution) was based on a lecture delivered by Professor Russell at the opening of Technology's great Spectroscopy Laboratory, which has subsequently assumed such a commanding position in making the spectroscope more useful to man. The director of this laboratory is Professor GEORGE R. HARRISON, who contributes the article on page 87 on the spectroscope's importance to industry. His article, together with Professor Russell's, serves as an admirable introduction to one of the great techniques of science.

**D**ISTINGUISHED for his studies of internal secretions and as a biochemist, Dr. ALLAN WINTER ROWE, '01, has been a frequent and welcomed contributor to these pages. He is Director of Research at the Evans Memorial of the Massachusetts Memorial Hospitals, President of the Association for Study of the Internal Secretions, a leader in amateur athletics, and a member of the Institute's Corporation. Among his recent contributions to The Review are: "Endocrine Therapy," "Athletics and Health," and "Causes of Misbehavior." His article on page 93 summarizes recent advances in our knowledge of the causes of physical abnormalities and describes research toward this end conducted at the Evans Memorial.

IN September Dr. ROBERT J. VAN DE GRAAFF, of Technology's Department of Physics, delivered by invitation two papers before the British Association for the Advancement of Science, one on the subject of the high-voltage generator, described on pages 90 ff., and another on high-voltage electrostatic engineering. In reporting on these two papers, the Manchester *Guardian* of September 14 said, "Mr. Van de Graaff, of the Massachusetts Institute of Technology, gave two excellent papers on his researches on electrostatic machinery for producing high voltages, and as a possible form of commercial dynamo. His work is of the highest technical interest and may provide new methods of atomic disintegration and even of producing electric power. Like many of the American scientists, and contrary to popular belief, he is most modest in the description of his admirable work."

As The Review goes to press, the giant generator at Round Hill is being swung into action against the citadel of the atom. Symbol of the boldness and ingenuity of the modern scientist, it is a milepost along the path of man's progress toward a better understanding of the nature of matter. ¶ The article on transatlantic air transport, which opens the *Trend of Affairs* (p. 97) was prepared by Daniel C. Sayre, '23, formerly Contributing Editor to The Review and some time Assistant Professor of Aeronautical Engineering at Technology.

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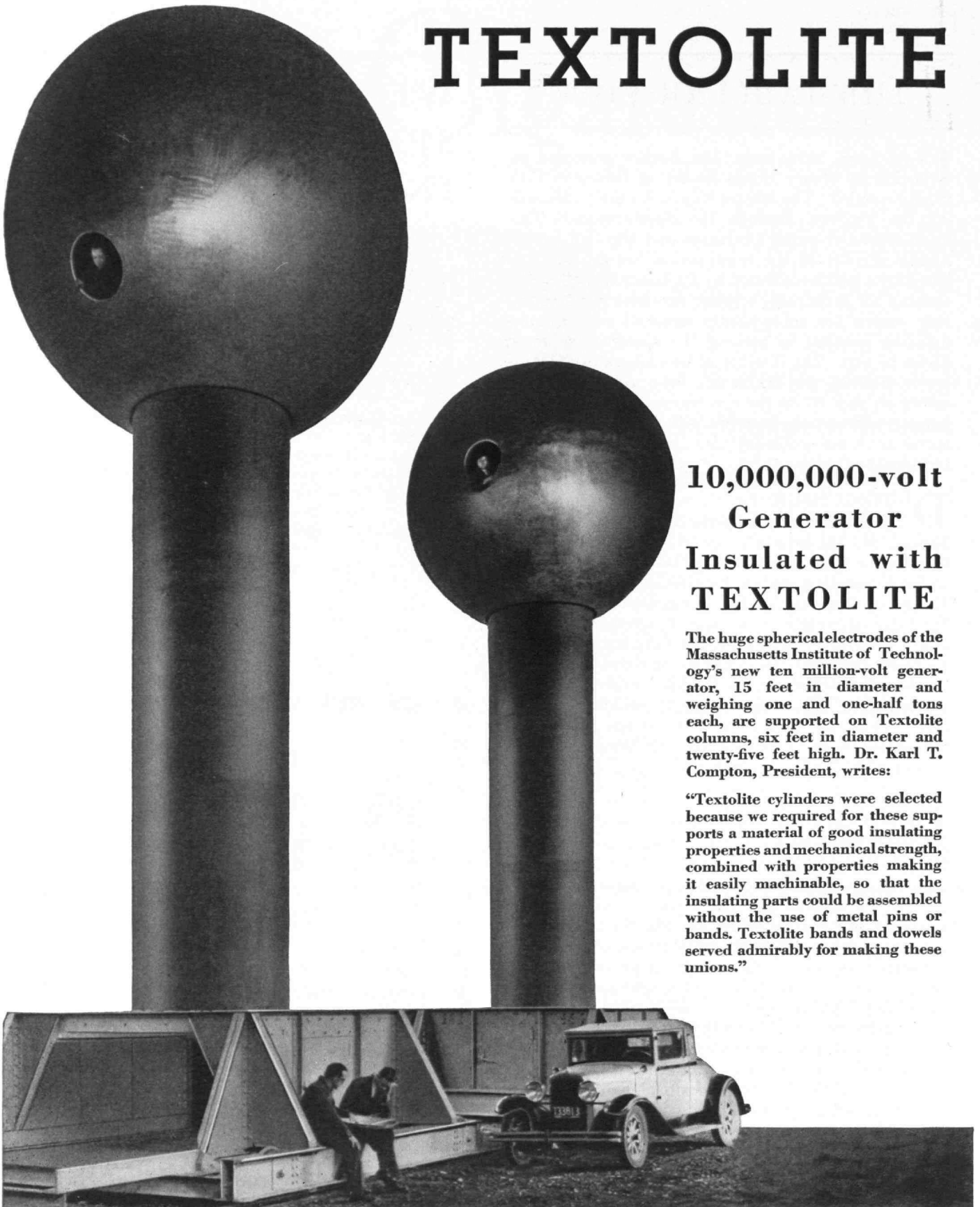


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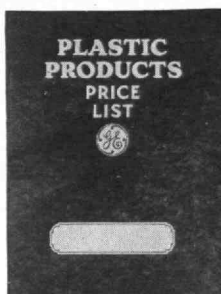
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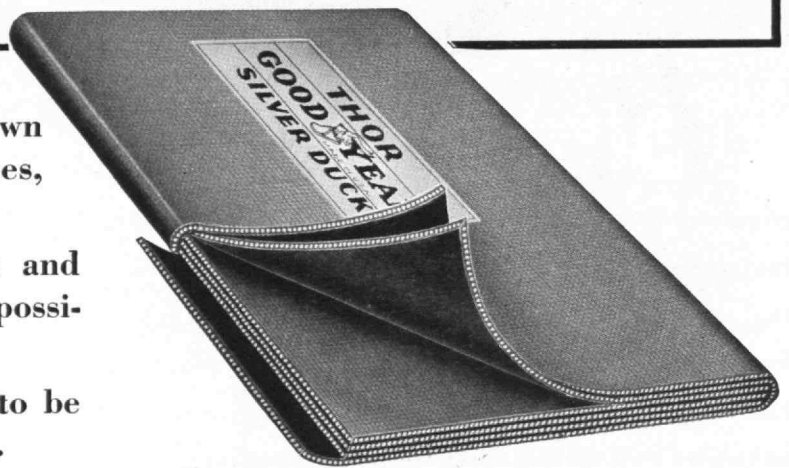
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Vol. 36

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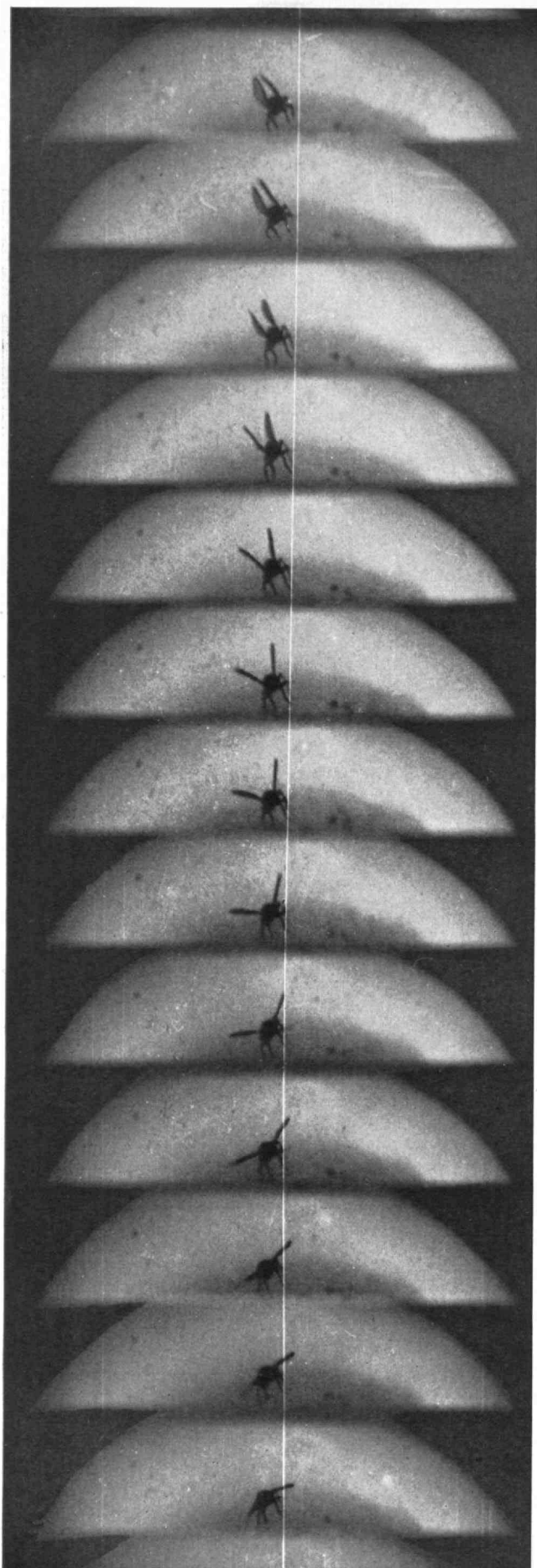
Business Manager  
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JOHN E. BURCHARD, 2ND

PUBLISHED MONTHLY FROM OCTOBER TO MAY INCLUSIVE AND IN JULY ON THE TWENTY-SEVENTH OF THE MONTH PRECEDING THE DATE OF ISSUE AT 50 CENTS A COPY. ANNUAL SUBSCRIPTION \$3.50; CANADIAN AND FOREIGN SUBSCRIPTION \$4.00. PUBLISHED FOR THE ALUMNI ASSOCIATION OF THE M. I. T. REDFIELD PROCTOR, PRESIDENT; HARRISON P. EDDY, JR., EDWARD L. MORELAND, VICE-PRESIDENTS; CHARLES E. LOCKE, SECRETARY; J. RHYNE KILLIAN, JR., TREASURER.

PUBLISHED AT THE RUMFORD PRESS, 10 FERRY STREET, CONCORD, N. H. EDITORIAL OFFICE, ROOM 11-203, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE A, MASS. ENTERED AS SECOND-CLASS MAIL MATTER AT THE POST OFFICE AT CONCORD, N. H. COPYRIGHT, 1933, BY THE ALUMNI ASSOCIATION OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY. THREE WEEKS MUST BE ALLOWED TO EFFECT CHANGES OF ADDRESS. BOTH OLD AND NEW ADDRESSES SHOULD BE GIVEN.





## The Flight of the Fly

*Aerial maneuvers, obligingly performed by a house fly (Musca domestica), before the lens of a super-fast camera. These pictures were taken at the record rate of 6,000 per second with exposures of approximately one-millionth of a second. Of all the high-speed photographs presented in these pages, these are the fastest. For other interesting examples of stroboscopic photography at M. I. T. see pages 104 and 105*

Photographed by  
Harold E. Edgerton, '27, and Kenneth J. Germeshausen, '32

# THE TECHNOLOGY REVIEW

Vol. 36, No. 3



December, 1933

## Hard-Headed Rainbow Chasers

*The Spectroscope Opens New Fields in Science and Industry*

BY GEORGE R. HARRISON

**A**STRONOMERS, chemists, biologists, engineers, textile manufacturers, physicists — more than a hundred individuals gathered in the George Eastman Research Laboratories of M. I. T. one day last summer with a common purpose. They were holding a spectroscopy conference, arranged by the Physics Department as one of the associated functions of its spectroscopy laboratory. Every day, for the greater part of a week, they were to meet to discuss what the spectroscope has done and can do to aid science and industry. The chief object of all at the moment was to find out how man's controlled rainbow producer could help solve their problems. It was, in effect, a group of hard-headed rainbow chasers.

The spectrum was first observed by man many centuries ago; even the most conservative estimate puts the date as far back as 4004 B.C. Its purposeful production, however, did not occur until 1666, when the great Sir Isaac cut a hole in his landlady's window screen, and, inserting a prism in the beam of sunlight which fell through it, flashed glittering colors on the wall. For many years thereafter nothing much was done about the spectrum, and it was not until 75 years ago that the first real spectroscope was constructed to give a foretaste of the wonders to come by lending its powers to the discovery of new chemical elements.

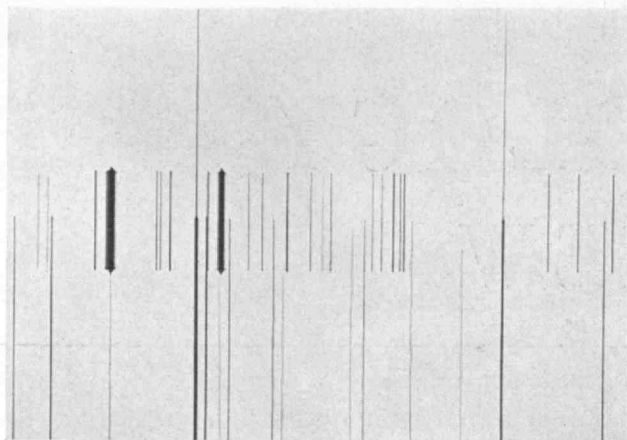
During the last few years the cycle of development which began at that time has culminated in recognition of the spectroscope as by far the most powerful tool now available to science. Its functions of super-microscope, super-telescope, super-thermometer, -clock, -yardstick,

-balance, are becoming so well known now as to be taken for granted by scientists. The progressive industrialist has begun to wonder whether there may not be something in this for him, and he who does not take the trouble to investigate may shortly expect to receive a jolt from the balance sheets of his competitors.

A watch manufacturer finds that a rival has introduced a marvelous new mainspring. This must be duplicated or improved on at any cost, but the first problem is to find what substances have produced its excellence of temper and elasticity. With much trouble and expense he obtains several dozen of the springs, and puts the problem up to his analytical chemist. What shall the chemist look for? He makes some guesses and dissolves a number of the precious springs to carry through the regular wet analyses for carbon, nickel, tungsten, copper, and as many more elements as his patience will allow and his boss pay for. But there are 90 known chemical elements, of which at least 75 might conceivably be of value in improving the qualities of a watch spring if introduced in the proper quantity. His problem is not solved until every one of these has been searched for, since there might be any number of important components. Even then he may never ferret the secret out, since we now know that as little as one part of a metal in 100,000 parts of an alloy may play an important part in changing its crystalline structure and hence its physical properties.

But let us take pity on the chemist before he gives up all hope, and suppose that his employer is sufficiently up-to-date to furnish him with a small spectroscope, or





*A small section of the spectrum of iridium as photographed with one of the large M. I. T. spectrographs to detect impurities in a small sample. The long lines are from the iridium atoms and from the impurities, while the shorter lines along the middle of the picture were produced by putting on the spectrum of iron for comparison, the known wavelengths of the iron lines being used as standards to determine the wavelength scale. The original spectrogram of which this picture is a part was over 40 feet long*

better, with a spectrograph which will record the spectrum photographically. Now all the chemist need do is take two of his springs, place them in holders so that he can strike an electric arc between them, let the flash of light which results pass through his spectrograph, and develop the resulting photograph of the spectrum. The whole procedure is completed in five minutes, and though all that can be seen in the picture is a series of short, unevenly spaced, parallel lines, the whole story lies there unfolded for him who can read.

Every atom can be made to emit light if treated with sufficient roughness, as in an electric arc or spark, and the radiation which it sends out brands it much more definitely than fingerprint ever branded criminal. As one knows that he is listening to broadcasting station WZZZ when he turns the radio dial to 422 meters and hears a noise, because only WZZZ uses that wavelength, so one knows that he is looking at light from sodium atoms when he sees the familiar yellow light of the sodium flame, because sodium atoms always broadcast on the yellow wavelength 0.5896 micro-meters. The spectroscope forms a line at each point in the spectrum corresponding to a wavelength which is present in the light entering it, so from the pattern of lines observed, the varieties of atom from which the light originates can be deduced.

All our up-to-date spectroscopic chemist need do is to look at the spectrum photograph, consult a table giving the wavelengths emitted by the various atoms, and proceed to pick out the groups of lines whose wavelengths together identify the elementary substances present in the watch spring. It is the work of a few moments to identify iron, copper, chromium, tungsten, nickel — all common in watch springs of one kind or another. But he notices another set of lines which the book says are due to beryllium. Now who would have thought that beryllium would improve a watch spring? A quick further check shows that nothing else of importance is present, since no spectrum lines remain

unaccounted for, and the problem is solved. Every part of this qualitative analysis was made with a single picture obtained by using only one pair of springs, and the results are complete, definite, and accurate.

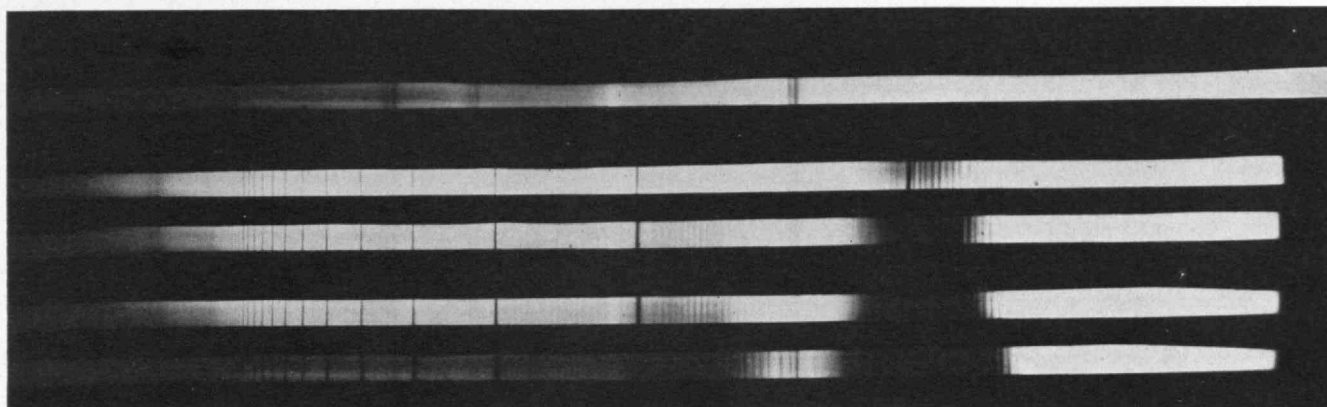
The sensitivity of the spectroscope in detecting minute quantities of matter present in a mixture is phenomenal. While the limiting trace which can be determined varies with the atom involved, certain elements like sodium and lead have an uncanny faculty of making themselves known to the instrument. A teaspoonful of table-salt needs more than two thousand bathtubs full of water in which to hide successfully. Nor is it necessary to have a large quantity of material to analyze; indeed a complete analysis can often be made with less than a milligram of material, detection of all metals occurring to the extent of one per cent or more being practically certain. Non-metals such as sulphur and carbon show less tendency to make their presence known under ordinary conditions, but even these can be stimulated by application of third degree methods in a vacuum spark.

Not only does the spectroscope furnish a powerful means of qualitative atomic analysis, but it can also be used for quantitative measurements. Here the technic is more complicated and the advantage of the method is not so overwhelming, but it is definitely superior to chemical wet methods when the quantity of material available for analysis is small, when the substance being determined occurs in minute quantities, and when speed and ease of manipulation are more important than the highest quantitative accuracy.

A few years ago the analytical chemists of a certain company manufacturing sheet zinc could find no difference in the constitution of zinc which cracked on rolling and that which did not. The spectroscope was invoked and revealed minute traces of impurities which were later proved responsible. It was found that as little as 0.001% of bismuth, tin, or antimony has a great effect on the rolling properties of zinc. It may not be necessary to remove such traces of impurity when found, for in many cases other impurities can be added to neutralize their effects.



*A portion of the camera used with one of the M. I. T. diffraction-grating spectrographs. Photographic plates are clamped along the two rails held by the uprights, to photograph the spectrum. This instrument is over 20 times as powerful as those needed for most industrial work*



*Spectrograms showing the absorption of light by sodium atoms. Light of all wavelengths is sent through a tube containing sodium vapor, and the transmitted light is analyzed by a small spectrograph. The narrow lines represent light which has been absorbed by atoms; the broad fluted regions, light absorbed by molecules*

Again, the spectroscope has been used to detect gross errors in the ordinary analytical methods. A speaker at the recent conference cited as an example of this a case where zinc castings had been sent to several firms of consulting chemists, who all reported aluminum as an impurity. A skeptical spectroscopist found no aluminum present, the offending element being gallium, which had masqueraded as its more common cousin in the chemical reactions.

The conductivity of copper is greatly affected by minute amounts of arsenic; the keeping qualities of rubber may be influenced by the amount and quality of sulphur and selenium incorporated in it; white lithopone paint may turn black on exposure to light if certain impurities difficult to detect chemically are not removed. Such examples could be cited without number, but it is indeed a conservative chemist or metallurgist of the present day who would deny the value of the spectroscope in making analyses.

Over 90% of the discoveries of modern astronomy have been made by means of the spectroscope. Stars, nebulae, comets, suns — all are made of atoms, and apparently few atoms under the exciting conditions of life in a hot heavenly body can be prevented from broadcasting much of their life histories and future aspirations. Even so simple a thing as whether a star is approaching the earth or receding from it is told by the atoms it contains, and one of the latest bits of choice gossip received is that the universe is expanding and may be blowing up.

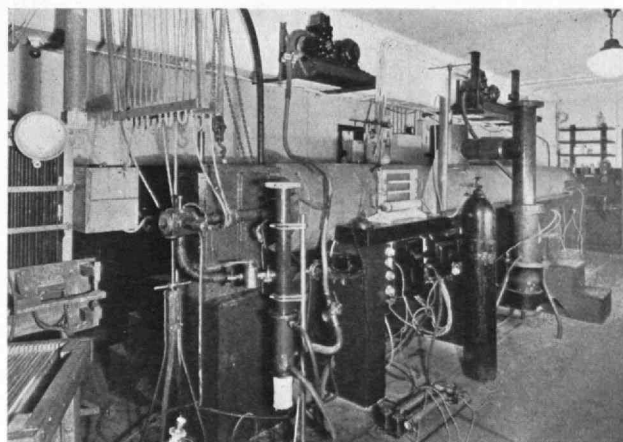
In physics the tale of spectroscopic discoveries is almost as long. A great proportion of our information about the structure of the atom and the arrangement of atoms and molecules in crystals has come via this route, for here we can make use of not only the ordinary spectroscope that works with visible, infrared, and ultra-violet light, but also of similar instruments working in the x-ray region. Now it has been discovered that electrons and atoms themselves may behave as waves, and it is possible to construct electron and atom spectroscopes to aid in solving the riddle of Nature.

In biology and medicine less application of spectroscopy has been made than in most of the other natural sciences, but it has already been shown to be a very powerful tool in these fields also. At present more prob-

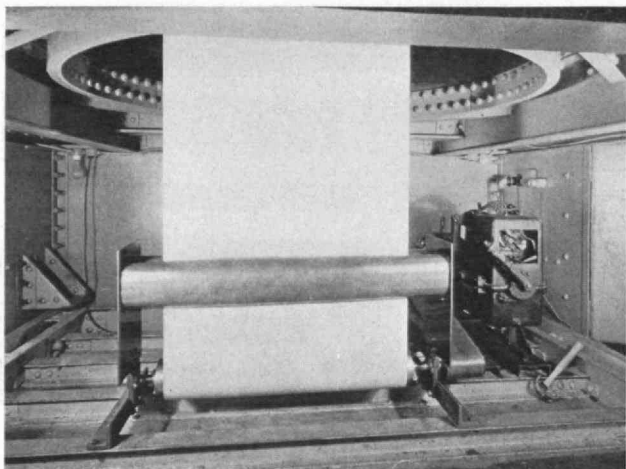
lems seem to be opened by its use than are being solved by it, but this should be a healthy condition. Why do the livers of scallops concentrate cadmium? Why do the irises of cattle over three years old yield an ash which contains over fifty per cent barium, a fact true of no other animal? According to the spectroscope, the red feathers of the touraco contain seven per cent copper, while the colored petals of flowers usually have a lower mineral content than white specimens of the same species.

There is probably no connection between the interest of the modern throat specialist in removing tonsils from his patients and the fact that these tonsils contain deposits of silver which they have concentrated from the blood, but the spectroscope reveals that just as the oysters of the sea contain their pearls, so these ostreaceous appendages carry a precious cargo of their own.

As ordinarily used, the spectroscope reveals only the atoms present in a mixture or compound rather than the molecular aggregates in which they find themselves. But by sending light of many wavelengths through a liquid, a solution, a glass, or any other partially transparent medium, and then analyzing the transmitted light to see what wavelengths have been absorbed, it is often possible to determine not (Continued on page 110)



*A large vacuum spectrograph in the M. I. T. spectroscopy laboratory, used for photographing light of very short wavelength. It is kept permanently evacuated to one ten-millionth of an atmosphere pressure*



*These endless paper belts, operating vertically within the hollow columns of each of the two units, run from driving motors in the bases to pulleys within the spheres. The electrical charge carried up by the belts is "sprayed" on them at the base at the comparatively low pressure of 20,000 volts. The generator may also be operated as a self-exciting machine which draws its charges of electricity from the earth. The process is not unlike the old-fashioned method of raising water from a well by means of small buckets on an endless chain, each bucket dumping its load as it turns over a pulley at the top. In the generator the electrical charge carried up by the belts is taken off and stored on the surface of the big globes by means of "brushes" fastened near the upper pulley. Special air-conditioning machinery within the supporting columns of the machine maintains the proper atmosphere for efficient operation. It should be noted that belts in one sphere store negative charges; those in the other sphere, positive. When the accumulated charge on each sphere reaches approximately 5,000,000 volts, the terminals discharge at a combined electrical pressure of 10,000,000 volts*



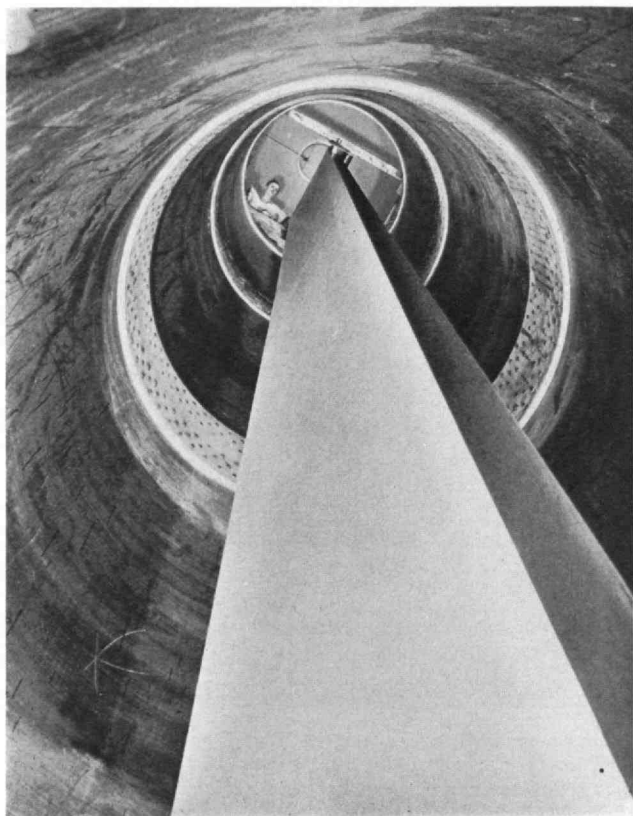
*To the layman, one of the most amazing features of the generator is the fact that while the machine is in operation, the safest place for the research workers is within the huge terminal spheres on which the high-voltage charge is stored. The interiors of these aluminum globes are compact laboratories with lighting facilities and various instruments for research*

## Colossus

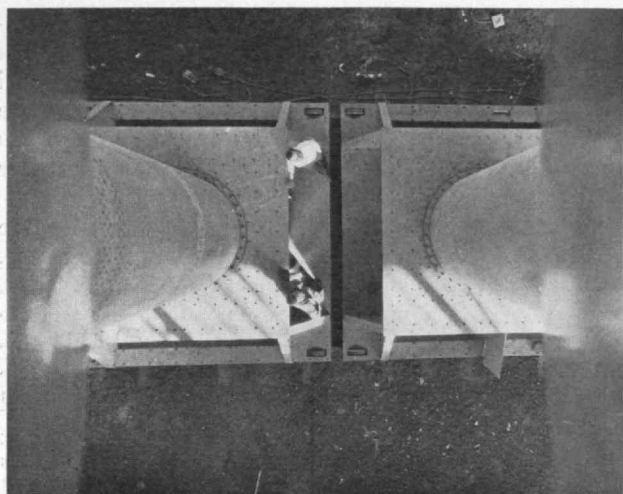
### Technology's Giant Generator—

**A** MIGHTY siege gun of science has gone into action at the M. I. T. Research Station, South Dartmouth, Mass. Its purpose is to batter away at the nucleus of the atom, mysterious and formidable stronghold that has defied man in his march toward an understanding of the material universe. This great instrument of aggression against ignorance is an electrostatic generator producing 10,000,000 volts, a potential far higher than any hitherto accomplished (see the graph on page 92). Conceived by Robert J. Van de Graaff and built by many hands, it is ready, with its capacity of 20 or more kilowatts of steady direct current, to hurl missiles of high-voltage ions into the inner atom.

To describe clearly the field of research in which the generator is expected to mark the beginning of a new era, it is first necessary to outline what scientists now know about atomic structure. All of the positive electricity, more than half of the negative electricity, and by far the greater part of the energy of the universe reside in the nuclei of atoms. The masses of these nuclei are known with some accuracy and the number of units of positive and negative electricity in each is accurately known. It is known that some nuclei are unstable and gradually break up in the phenomenon of radioactivity, as manifested by radium. Yet practically nothing is known about the arrangements of electrons, which are the negative particles, and protons, the positive particles, in nuclei. Science knows little about their motions, or the forces which hold them together, or why they control the behavior of external electrons as they







Supporting columns are made of a material called textolite, which is composed of hundreds of layers of paper, 17 one-thousandths of an inch thick, cemented together under high pressure with shellac. The walls of the columns are five-eighths of an inch thick and each weighs over a ton. Each unit with its truck weighs approximately 16 tons

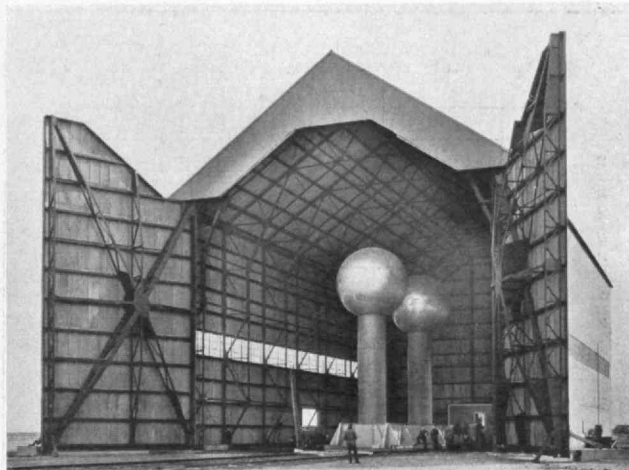
## of Volts

### *Its Purpose and Significance*

do. It has only been within the last few years that physical agencies within man's control have been found to disrupt or disturb atomic nuclei.

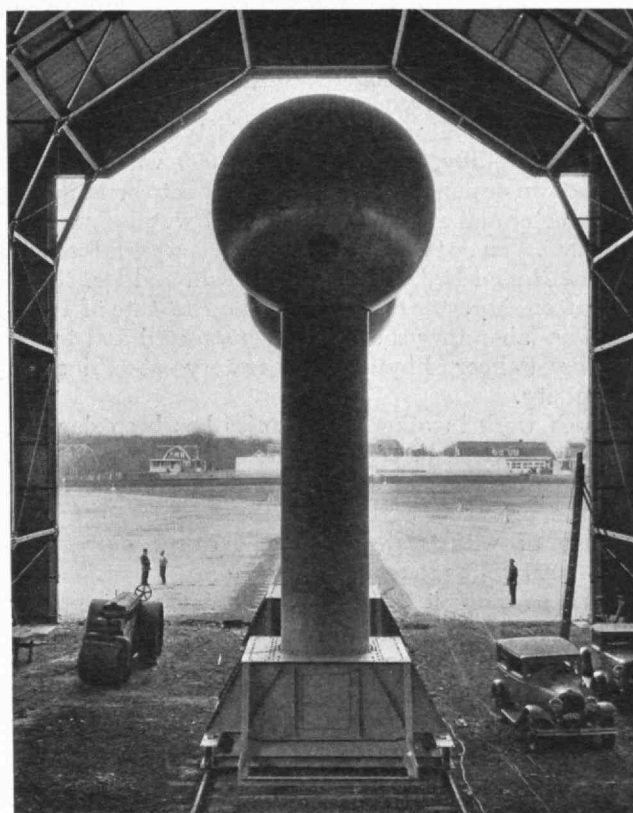
The method which has proved successful in disrupting atomic nuclei or disturbing them so their behavior can be studied is to bombard them with particles in which a tremendous amount of kinetic energy, that is, energy which is due to the momentum and speed of the particles, is concentrated. The only particles known to man with sufficient energy for this purpose are the alpha particles which are spontaneously but relatively infrequently shot out from radium, or the newly discovered neutrons which are produced when these alpha particles strike certain kinds of atoms, or electrified particles. Among these particles are hydrogen or helium ions which are speeded up to tremendous velocities by the application of high voltage.

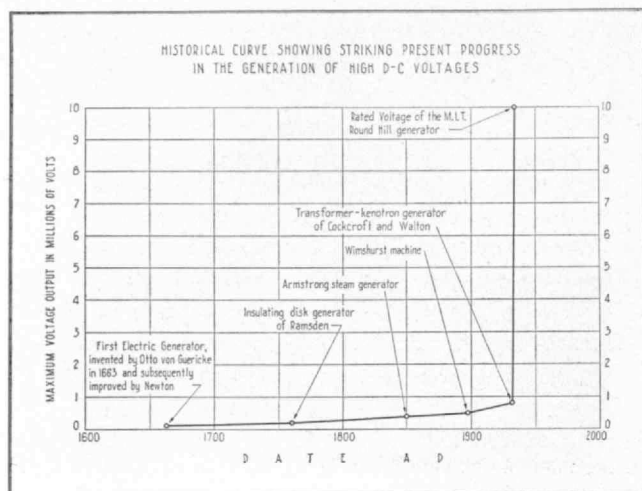
The Van de Graaff generator has been designed for the purpose of speeding up electrified particles in order to discover the effects which will be produced when they bombard chemical elements of different types. The first proof that this method may be used was found by Dr. J. D. Cockcroft and Dr. E. T. S. Walton at Cambridge University, and has since been verified and extended by them and several other workers. The Van de Graaff apparatus will permit such experiments to be extended to much higher voltages than any hitherto employed and to far greater numbers of electrified particles. In this way it may be expected that additional types of atomic disintegration may be discovered and that some of them may be produced on a large scale.



Above. The giant proportions of the generator made it necessary to find a building of unusual size in which to house it. The big airship dock at Round Hill was found to be suitable and Colonel Green generously placed it at the disposal of Technology. The building is 140 feet long, 75 feet wide, and 75 feet high. Its great doors, which can be easily opened by one man, weigh 47,287 pounds

Below. The generator consists of two separate units, each with a polished aluminum sphere (weighing  $1\frac{1}{2}$  tons and 15 feet in diameter) resting on a hollow cylindrical insulating column of textolite, 25 feet high and six feet in diameter. These columns are mounted on heavy, four-wheeled trucks operating on a railway track 14 feet wide. This arrangement permits variation of the distance between the two great terminals and also makes it possible to move them into the open air to avoid flashes to the roof girders of the hangar, a distance of more than 20 feet from the spheres. The total height of the spheres above the ground is 43 feet





In order to carry out these experiments two instruments are necessary: one is the high-voltage generator, which is now being tested; the other is a vacuum tube capable of withstanding hitherto unattainable high voltages. A vacuum tube is necessary because all molecules of air must be cleared from the path of the high-velocity electrical particles in order that they may have an unobstructed flight in their attack upon the atoms. The extent to which this great tube will be evacuated is indicated by the estimate that when the air has been pumped out only a thousandth part of a millionth part of an atmosphere will remain.

Until recently nearly all vacuum tubes have been constructed of glass, which has been used up to voltages of about one million. At this voltage, or even less, glass usually breaks. Laminated paper, a great number of layers of thin paper carefully cemented together with shellac under high pressure, is the material being used in construction of the giant vacuum tube designed for the Van de Graaff generator.

A small laboratory model of this type of tube has been successfully tested up to 300,000 volts without breakdown or puncture. The large tube is to be 12 inches in diameter and about 40 feet long. It was designed by Dr. L. C. Van Atta, a member of the generator research staff at Round Hill, Dr. Van de Graaff, and Dr. Harry A. Barton, Director of the American Institute of Physics. The laboratory model was constructed and tested at the Palmer Physical Laboratory at Princeton University.

Much work in other laboratories has been devoted to the perfection of tubes to stand 500,000, 1,000,000, or 2,000,000 volts of surging or momentary current, and the prospects of building the new type of tube capable of withstanding constant direct current at 10,000,000 volts are excellent.

Perhaps the first tube to stand voltages of the order of 1,000,000 volts was designed by Professor R. D. Bennett, now of the Department of Electrical Engineering at M. I. T., but then a National Research Fellow at the California Institute of Technology. The development of this tube has been continued by Dr. C. C. Lauritsen and others at that institution. Dr. W. D. Coolidge, '96, Director of the Research Laboratory

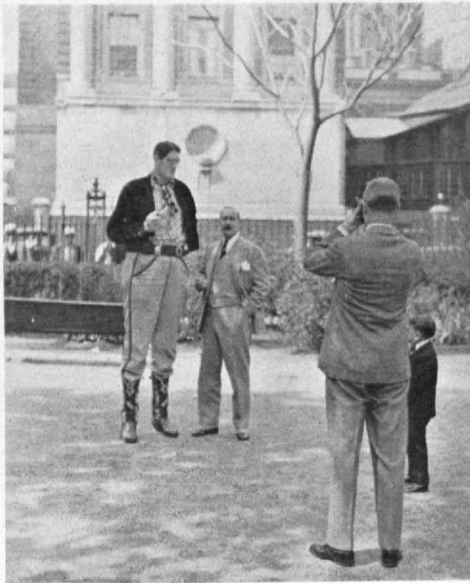
of the General Electric Company, has developed high-voltage x-ray tubes for therapeutic purposes, some of which are now in use in hospitals. Arno Brasch and Fritz Lange in Germany have developed a high-voltage tube with the unique construction of alternating rings of aluminum, rubber, and paper, held together under pressure.

Technology's great tube will reach from one to the other of the great spherical terminals of the generator. In one end will be placed a source of electrified particles, such as hydrogen ions or protons, and these will be pulled down the tube by the electric field and will bombard a target at the end of the tube connected with the other sphere. This target will be of material composed of the atoms which it is desired to study. The bombardment made possible by a discharge of 10,000,000 volts will hurl millions of electrified bullets, infinitesimal electrified particles, against the atomic target. Moving at velocities 100,000 greater than the speed of any rifle bullet, a speed so great that they would encircle the earth at the equator three times in a second, these electrical projectiles strike the target with such force that they rush practically unimpeded through the guardian ring of outer atomic electrons and smash on through the inner potential barrier into the mysterious nucleus, estimated to be a trillionth of an inch in diameter.

From the target, as this 10,000,000-volt bombardment continues, are expected to come the most powerful x-rays ever produced. Indications are that they will be much more penetrating than the radiations from radium. And from the target are expected also to come whatever types of atoms that may be produced by the high-voltage process of disintegration, atoms synthetically produced in a man-made method of transmutation. The dramatic results of high-voltage attacks on the stronghold of the atom, the penetration and the smashing of the atomic nuclei, are revealed to science in faint splashes of light or scintillations, some of which can be photographed. These nuclear disintegrations can also be detected and investigated by other means, including the Wilson Cloud Chamber.

A variety of supplementary apparatus is under construction for a study of the radiations which will emanate from the target. This apparatus, which combines features of gas ionization, photography, and deflection of electrified particles by large magnets, has been a steady development by physicists since the first discovery of the electron and of radioactivity at about the beginning of this century.

In addition to atomic research, some of the scientific problems which are expected to be investigated with the generator are: (1) Production and study of x-rays of many million volts, which may, among other uses, be very valuable in the treatment of disease; (2) Use of x-radiation thus produced to extend knowledge of the relation between wavelength of radiation and absorption of matter to the region of much shorter wavelengths. This should make possible, for example, a much more accurate estimate of the wavelength or speed of cosmic rays than is now possible. Such a study would have a considerable influence on the astrophysical theories of the fate of the universe.



*The author (standing next to the giant) and Dr. Hector Mortimer (with his back turned). An interesting juxtaposition of two normal men and of two of the big and little people who were the subjects of the study described in the article below*

# Giants and Dwarfs

## *Light on the Causes of Physical Abnormality*

BY ALLAN WINTER ROWE

FROM the earliest times of recorded history, individuals of markedly abnormal configuration have been objects of curiosity, of interest, and not infrequently of admiration. The very tall, the very short, and even the very fat have played their several rôles down the tale of the ages. Egypt worshiped Pthah, a dwarf deity, as one of their principal divinities; in like form but under other names he reappears in the later mythologies. Legends and folk tales are filled with the stories of giants and dwarf heroes; in others they appear as the evil genius of the story and the frustration of their malevolent purpose is the theme. Even in the earliest of our civilizations, people of position retained both giants and dwarfs in their *entourage*; in the Middle Ages, the court jester, usually, if not always, a dwarf, enjoyed wholly exceptional privileges and in not a few instances played a vital part in the political life of the day.

Velasquez's portraits of the court dwarfs in Spain offer evidence of the high esteem in which these little people were held, while the history of Sir Jeffrey Hudson is one of the real romances of the Seventeenth Century. Giants, perhaps through the limitations of canvas, have been less frequently the object of the painter's skill, but literature has more than compensated them for this neglect by the sister art.

Where the dwarf of the Middle Ages became court favorite and a political power while his gigantic brother was offered a variety of careers, of which the practice of arms was an outstanding example, the big and little people of today are less fortunate. Public interest in

them, it is true, is still manifest, but the opportunities which open to them in present times are only those of the exhibition, the stage, and, most recently, the moving pictures. In all well-regulated circuses, the "sideshow" is a recognized and integral unit and to this one goes to find dwarfs, giants, and many other individuals whose significant physical abnormalities divide them inexorably from the common run of mankind.

While throughout the ages the reports and records of these unusual people have engendered a rich literature, it is only within the past few years that science has thrown any light on the factors of causation of their abnormal physical status. The influence of the ductless glands, partial knowledge of which is the achievement of no more than the past few decades, offers the background for the mechanisms producing all of the real giants and a large proportion of the dwarfs. Even with the imperfect knowledge of today, it is possible for us to survey the portraits painted by some of the greatest masters in history and from the somatic evidences there disclosed draw some inferences as to the individual background, in terms of incretory function level during the earlier stadia of life when growth and development are most manifest. As has already been said, scientific medicine in its several departments has thrown some light on the agencies which augment growth to produce individuals of gigantic proportions, while antithetical influences inhibit growth to produce dwarfs.

Of the principal agents of which we are today informed, the pituitary gland, or hypophysis, may well be regarded as playing the major rôle.





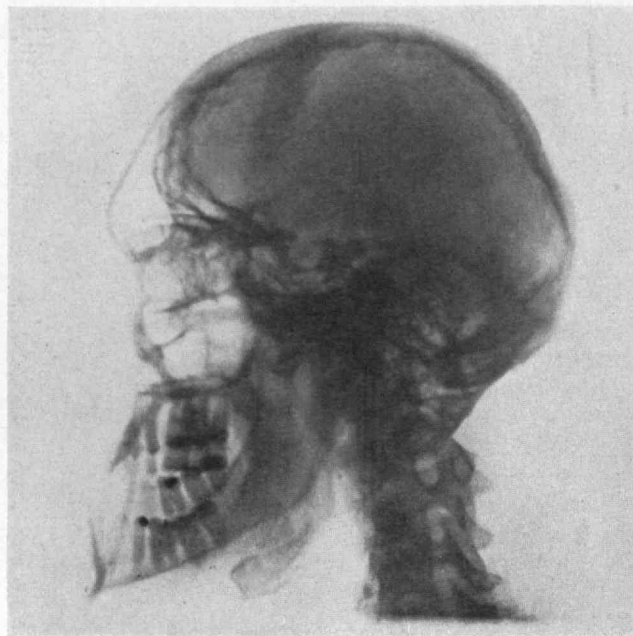


1. Normal skull

This tiny glandular structure, lying in the bony canal of the *sella turcica* within the skull, by its overproduction of certain potent substances which we call hormones, or messengers, is the primary causal agent in developing individuals of truly gigantic stature. The opposite status of lowered function with decreased production of these same materials is responsible for one large group of the dwarfs. These little people which, by the way, is the term which they usually apply to themselves, whose abnormality has a pituitary background, are usually well proportioned and possess normal or even, in individual cases, a really superior mental equipment. Failure of the thyroid gland, another of the endocrine concert, lying in the neck, will, in the early stadia of life, also produce dwarfism but of an entirely different type. Early thyroid failure produces the misshapen, mentally retarded cretin, and the correction of the infirmity of these sufferers by the administration of the active principles of the gland at fault constitutes one of the many miracles of modern scientific medicine. With the pituitary dwarf, as noted, we usually have a mental development commensurate with the years of life; the uncorrected cretin, on the other hand, falls as low in the mental as he does in the physical scale.

There are yet other types of dwarfism, some deriving with reasonable certainty from morbid states unassociated with the ductless glands, and yet others as, for example, the so-called achondroplastic dwarf, a modern troglodyte, whose underlying causal defect is today a mystery. Of the historical dwarfs whose presentments have come down to us, some are found who suggest strongly a presumptive pituitary background, others are almost certainly cretins, and yet others present the characteristic configuration which defines their proper classification as achondroplastic.

While from the foregoing it is patent that several causes of dwarfism are known to exist while yet others may be regarded as probable, only one certain agency is



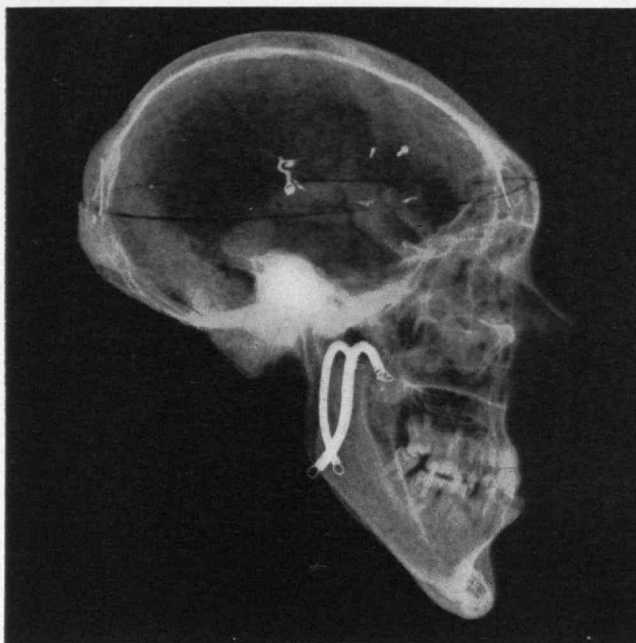
2. Acromegalic skull of giant (Type I)

surely correlated with true gigantic overgrowth. Certain functional defects of other members of the endocrine group will or may probably produce very tall individuals, but the pituitary alone, so far as present knowledge goes, is competent to produce a true gigantism.

It was my privilege a few months ago to have an opportunity to study a very well-known professional giant, whom many of my readers may identify from the illustrations of this article. At the same time, like investigations were carried out with a considerable group of his professional colleagues standing at the opposite extreme of physical growth. It is a real pleasure to acknowledge my indebtedness to these friendly people, who at a considerable sacrifice of personal convenience extended to us the opportunity of securing the valuable data deriving from their study.

J—E— is a true pituitary giant now in his 27th year. As nearly as can be learned, his growth was substantially normal until he reached the age of eight; at that time was initiated spontaneously the period of tremendous overgrowth, terminating when he was about 16, which has produced his present impressive altitude. While the initial overactivity of the gland has equally spontaneously subsided in the supervening years so that at present there are a number of objective evidences of function levels frankly inferior to the normal, there remain a number of residua of the period of riotous growth and in them, through the agency of the Roentgen ray, one can read many things which throw some light on the underlying mechanism of growth.

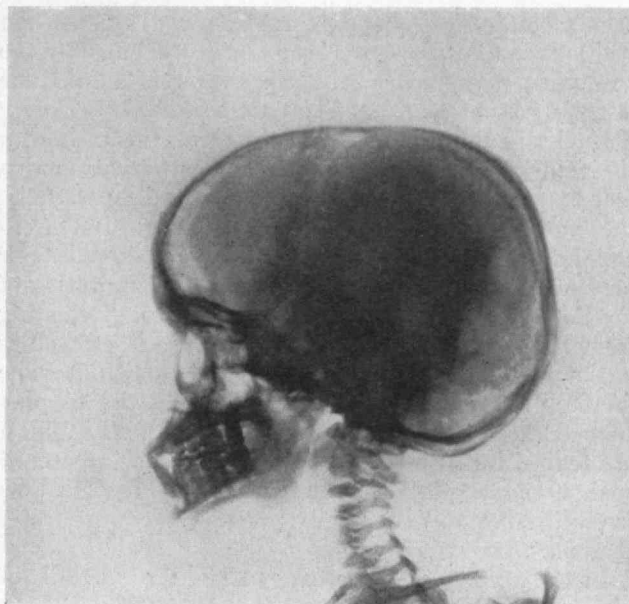
One of the writer's colleagues, Dr. Hector Mortimer of London, some two years ago recognized certain features of bony change, particularly as manifested in the skull, and in a paper now in press is describing this new and significant chapter in the natural history of the pituitary gland. For purposes of illustration we are



3. Another acromegalic skull

including three conventional skull pictures as produced by radiography. One of these (No. 1) is that of an entirely normal adult human skull. Skull 2 is that of our giant and the changes in this skull conform to the characteristic pattern of pituitary aberration which we have designated as Type I and which is the end result of progressive and sustained hyperactivity of the gland. Comparison of this picture with the normal shows that an enormous expansion of the entire cranial structure is the predominating feature. The inner and outer tables of the vault are widely separated through an excessive expansion of the intermediate bony structure producing a thick but not a heavy skull wall. The air chambers or sinuses throughout the skull but particularly in the frontal group are tremendously hyperpneumatized; the lower jaw increases in size and thrusts out beyond the normal cranial angle producing a marked prognathism. This change in the lower jaw, like that in the vault of the skull, is one of size and not of weight, as the radiogram discloses clearly that the prognathism is determined by the bony cellular elements and the massive jaw is gossamer-like in its inner composition. Incidentally, these same changes are reflected in many other parts of the bony structure, more particularly in the long bones of the extremities. Some idea of the structural proportions involved may be gathered from the fact that it required three large x-ray films placed side by side to record the single thigh bone and the proximal ends of the adjacent structures. Our giant's acromegaly is less well marked than in some of the other pictures in our collection (see Skull 3) but has been selected for presentation at this point as it constitutes an essential part of the record of this unusual and extremely interesting individual.

While we are considering the topic of skull changes, it may be well to consider those which characterize other forms of pituitary aberration. As the acromegalic (Type I) embodies the progressive and sustained



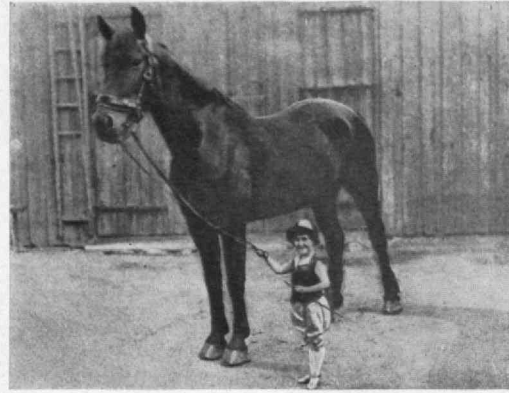
4. Skull of a true pituitary dwarf (Type IV)

influence of overproduction, so the Type IV exemplifies the cranial condition at the other end of the functional scale. Here we have the skull of a true pituitary dwarf who, from early years to the present, in all probability has presented a definite inadequacy of that fraction or fractions of the pituitary hormones primarily responsible for growth. Examination of the picture shows that the inner and outer table of the skull are almost in apposition with a practical suppression of the intermediate zone whose extreme expansion in Type I determined the thickness of the cranial vault. Hypopneumatization characterizes the air chamber pattern, and with many of these people there is a complete failure of development of the frontal sinuses. Associated bony retardations produce the small face which is so characteristic of the little people, and this by resultant geometrical rearrangements engenders a suggestion of a prognathism which is apparent rather than real. There is no enlargement of the lower jaw analogous to that observed in the acromegalic, but the bony structure may be swung out of its normal relationship to produce an abnormal cranial angle. The skull here shown is that of one of the girls in the family of dwarfs pictured in this article. All four showed precisely the same type and in only one of them, the tallest of the group, is there even a suggestion of frontal sinus development. The other dwarfs who are pictured at the bottom of page 93 are also of pituitary origin, and the examination of the series of skull radiograms from the entire group betrays a similarity which approaches identity in the more significant features. The charming little equestrienne at the top of page 96 is 22 years of age and 95 cm. (35.5 in.) in height. She has recently appeared in the public press as a result of a visit to Washington, at which time she furnished a whimsical and enjoyable moment of relief in the dreary waste of a government investigation. Her history records that at the age of 16 she could walk directly under the family dining room table without bending, and while the later years have

been accompanied by some further upward growth, she still falls short of the towering eminence attained by the yardstick. It should be said in passing that all of these little people as well as the giant are possessed of entirely normal mentalities, in fact several of them show a shrewdness in the judgment of current events and a real maturity of thought and understanding which is the more surprising when one considers that from childhood the majority of them have followed their present somewhat nomadic career with its limitation of formal educational possibilities. The giant, graduating from his local high school in one of the largest cities in the Southwest, told me with much humor that while football was forbidden him, he was allowed to play basketball. This brought a dire confusion to the opposing teams, for in moments of stress with a threatened goal, he could place his hand over the top of a low-swung basket and effectually preclude the entrance of the ball.

In the studies of the group, many of the details of which for lack of space may not be entered into here, fairly complete measurements were made of the energy metabolism. This is normally determined by the measurement of the actual oxygen consumption of the individual under certain conventional limiting conditions and then the calculation of the energy requirement from the calorific value of the gas quantity utilized. With the little people, the regular type of closed circuit apparatus was directly adaptable. With the giant, however, a few breaths would suffice to exhaust the available gas supply. He told us that at an earlier time an attempt had been made to carry out this measurement upon him, using standard apparatus. In a time far too short to yield a dependable measurement, he had the spirometer bell bumping on the bottom and was in imminent danger of an asphyxia, readily averted, it is true, by the removal of the mouthpiece. The experience had remained in his mind, however, as an unpleasant one and we were unable, with the few opportunities available for this measurement, to reduce him to a proper basal state of sedation. With this exception, however, all of the other measurements showed a depression of the energy requirement which could be expressed in part at least in arithmetical terms.

The measurement of oxygen consumption or, as it is more usually designated, the basal metabolic rate, has assumed a very important rôle in one of the more recent chapters of scientific medicine. The establishment of normal standards of performance primarily resulting from the investigations of the late W. O.



*She falls short of the towering eminence of the yardstick*

Atwater and his associate, Dr. Francis G. Benedict, and more recently from the Carnegie Nutrition Laboratory under the direction of the latter, and the Russell Sage Institute of Pathology under the guidance of the late Graham Lusk and his associate, Dr. Eugene F. DuBois, have given us the criteria for comparison, enabling the observer to estimate abnormality both in amount and in direction. Normal standards, however, derived from normal people are influenced by such basic factors as sex and age, and in their expression are correlated with certain biometric magnitudes such as height, weight, and area of body surface. In making use of these standards and several others derived by other investigators through other generalizations, a perplexity at once arises. Our dwarfs, for example, have the stature of children, in the majority of instances, the physical immaturity of the earlier years of life, and yet have chronological ages, even in this brief series of adults, approaching middle life. Giants present the same problem but from another angle and it seemed reasonable to assume that the existing standards may be extrapolated with some measure of warrant at least to meet the exigencies of this problem. In the present instance a partial solution was secured by comparing the actually observed energy consumption with all existing prediction formulas based upon actual factual data. In every instance, although in far from uniform degree, the little people showed a depression of the respiratory metabolism to levels significantly lower than the lowest boundary of the normal zone. In some instances, at least, this depression was of the order of 30% or 40%, a highly significant magnitude and one susceptible of interpretation in the individual of normal configuration and size as one concrete measure of aberrant endocrine function. As stated before, the giant yielded values which were certainly above the truth but even with this limitation the downward tendency was unmistakable. Because of the uncertainty of the prediction standards, too much weight may not be given to the actual arithmetical expression of the individual deviation.

One other interesting feature may be touched upon before terminating this very fragmentary report. In the skeletal structure in earlier years bony platelets are found at the ends of the long bones but are separated from them during the years of growth. While such separation exists, longitudinal growth of the bone is possible, and only when these (Concluded on page 114)



*The x-ray photograph (No. 4) at the top of page 95 of the true pituitary dwarf was made from the head of one of the girls above*



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# THE TREND OF AFFAIRS

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IN THIS SECTION: *Transatlantic Air Transport* (97); *Platinum Printing on Sheets of Gold* (98); *Oil Wells "as Crooked as a Dog's Hind Leg"* (98); *Introduction to the Art of Air Travel* (99); *The Opportunity for Achieving Mural Beauty in America* (100); *Government Transmission of Electric Power in England* (102); *Scientific Hegira* (103)

## Yesterday's Wonder

NO MATTER what new refinements of war, pestilence, peril, and collapse are to be our dosage in 1934, we do seem in for a definite step forward in the field of transportation. Unless the announced intentions of the world's four most important international airways corporations are completely frustrated, there may be regular scheduled airplane crossings of both the North and South Atlantic within a twelvemonth.

In the South Atlantic, France, Germany, and at times Italy have been experimenting, negotiating, agreeing, and disagreeing for a number of years. Finally agreeing to disagree, both France and Germany are to offer independent rival services. Italy seems to have at least temporarily abandoned the field.

The French project is but the consummation of plans laid in 1928. At that time Aeropostale inaugurated a fast mail and express service by plane to Dakar on the western coast of Africa, thence by fast cruiser to Natal in Brazil, from there by plane to Buenos Aires.

The non-stop distance from Dakar to Natal is 1,595 miles. French airmen have flown the route on several occasions. Last January Mermoz made the trip carrying six companions and a load of mail. Saint Paul's Rocks, 500 miles from the Brazilian coast, and Fernando Noronha, an island within 175 miles of Natal, lie directly along the route and form excellent emergency stopping points.

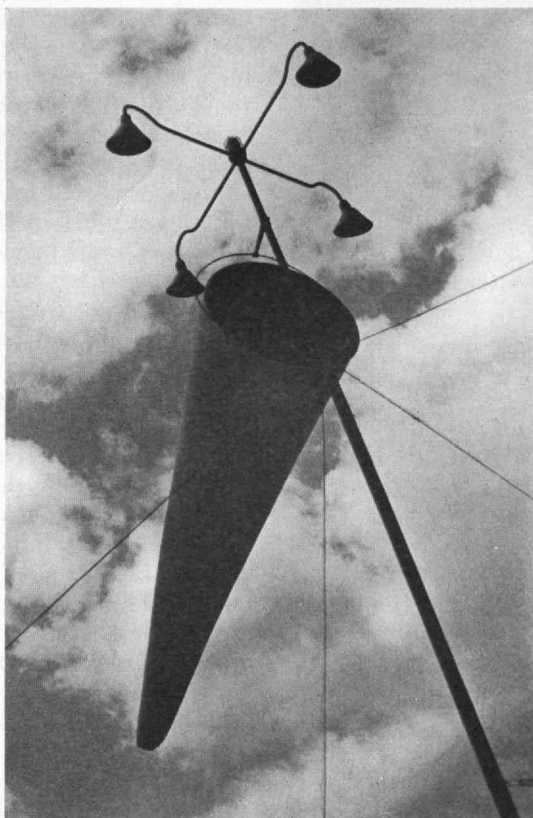
Weekly flights are to start in April of 1934, replacing the trips by cruiser. At first they will be carried out in an improved model of the landplane used by Mermoz. Meanwhile Bleriot, Latecoere, and other French manufacturing companies, stimulated by government competition, are at work on the development of large flying boats for the service.

The German Luft Hansa has been carrying out extensive landing and catapulting experiments in mid-ocean with the steamer *Westphalen* and several large flying boats. Their line will run from Germany to Barcelona, to the Canary Islands, to British Gambia, thence to a mother ship permanently stationed at sea, and from there to Natal to connect with the overland South American airlines operated by the Condor Syndicate. Weekly crossings by plane are to supplement the already highly regular activities of the *Graf Zeppelin*.

In the North Atlantic, Pan-American is carrying on a many-fronted campaign to begin scheduled operations "not later than the spring of 1935." It has been making substantial progress in the complex negotiations with the governments of the various countries along the optional northern and southern routes. It has also had to deal with Aeropostale, which owns the flying concession in the Azores, and with Imperial Airways, which has similar rights in Bermuda and a considerable stake in the northern route. It is possible that an ultimate cooperative service will be inaugurated, with the planes of Pan-

American and Imperial Airways making alternate runs.

Technically, with its unparalleled background of operating experience, Pan-American seems more thoroughly equipped than any of the other companies. Its meteorological and general survey of the northern route has been particularly thorough. The route presents formidable difficulties in navigation, meteorology, and terrain, but Pan-American has already encountered and surmounted these same difficulties in various combinations in Mexico, Alaska, the Andes, and other places. The route via Newfoundland, Labrador, Greenland, Iceland, the Faroe Islands, and Scotland contains no over-water gap greater than the 500-mile Caribbean hop. The government, as is well known, is toying with the Armstrong seadrome plan.



F. S. Lincoln, '22

"At 150 miles per hour New York is less than 24 hours from Europe. Due to prevailing winds, eastward crossings might frequently take as little as 18 or 19 hours"



Luke Swank-Levy Galleries

*With construction beginning on several great bridges on the West Coast, engineers envision another bridge-building period, "perhaps rivaling that of the later 1920's"*

On the Bermuda-Azores route an over-water flight of 1,795 miles is required. With modern radio, ice-removers, and flight instruments, the problems of such a flight are almost entirely those of airplane and engine design. Pan-American's answer will be the giant four-engined flying boats now soon to be launched by the Sikorsky and Martin factories. Larger than any preceding craft save the DO-X, they can carry 50 passengers on a 500-mile hop. On a transatlantic flight, they will have a range of 2,500 miles against a 30-mile headwind while carrying a limited number of passengers and sufficient mail and express to justify their commercial operation. Their cruising speed of 150 miles per hour marks a distinct advance in the performance of large flying boats, and keeps pace with that of the recent superspeed land transports. The development of planes is proceeding so rapidly that still better performance may be expected anytime.

At 150 miles per hour New York is less than 24 hours from Europe. Due to prevailing winds eastward, crossings might frequently take as little as 18 or 19 hours, no westbound passage over 30. The world may be getting no better, but it is certainly getting a great deal smaller.

### Permanence of Words

NEWS from England of a new method of printing platinum characters and half-tone on sheets of gold to preserve the written word for the future emphasizes again the importance of recording in permanent form such rare documents and chronicles as may be worthy of that honor.

The ancients perpetuated their words on tablets of stone and metal. The Egyptians attained permanence to a remarkable degree by inscribing their writings on papyrus. From the tender skins of newborn sheep, goats, and calves, the Greeks made vellum, stretched it to an amazing smoothness, filled it with chalk, and polished it with pumice, dyeing the parchment a rich purple. Thereon they inscribed their thoughts for future generations. Some of these ancient parchments, beautifully illuminated, are still in an excellent state of preservation.

In this age, the life of the average book is estimated to be only a few hundred years, and in the light of much that is written, possibly this is very fortunate. There are, however, documents of state, the vital figures of life, and the thoughts of a very few wise men that should be preserved in some form which will challenge the power of time to destroy.

When, in 1931, the cornerstone of the George Eastman Research Laboratories was laid, special precautions for the preservation of the records laid within the stone were taken. Some of the records were placed in a glass tube filled with carbon dioxide gas, a method which is expected to guard them against deterioration for a long time. In the cornerstone of the District of Columbia's war memorial in Washington, the records were typewritten on a specially prepared cotton-fiber paper. They were sealed in an airtight copper box, from which the air had been evacuated and replaced with nitrogen gas.

The Japanese, long skilled in the making of fine papers, inscribed the names of victims of the 1923 earthquake with a special ink on a paper manufactured for the purpose by the Japanese government. This roll of the dead was then wrapped with oiled silk and encased in a sheathing of asbestos. It was then placed in airtight fused quartz containers filled with argon gas. As a final safeguard, the quartz containers were covered with asbestos, and finally with carborundum. This process is expected to preserve the records for at least 10,000 years.

The new English invention makes use of gold sheets 1/4000 of an inch in thickness and between 14 and 18 carats in fineness. The South African government has ordered two plaques for the new South African House in London, one to reproduce the King's speech at the recent opening together with the royal arms and the King's signature; the other in similar form to set forth the High Commissioner's reply and his signature, together with the arms of South Africa.

▲

*If transformed completely into work, solar radiation would produce, it has been estimated, about one horse power per square yard with the sun high in the sky. This output is equivalent to the burning of 400,000,000,000,000,000,000 tons of anthracite coal per year.*

### New Styles in Oil Wells

TO THEIR great skill in drilling to depths of two miles into the earth to tap oil-bearing sands, engineers have added the accomplishment of controlling the

direction of their drills. Contrary to the popular conception of an oil well, vertical holes are seldom attained, although until recently the drilling of a straight hole was the goal of every oil well crew. Elbows and "dog-legs" were difficulties to be avoided.

Today a small group of experts, whose services are in great demand, specialize in drilling oil wells with slanting or curving holes. Even "doglegs," the holes which twist and turn in their path are now used.

The reason for this change of front, for the development of the technique of steering drills thousands of feet through soil, rock, water, and sand, is the discovery that a slanting or curving hole permits a greater penetration of oil sands. It permits the drilling of a hole on the shore of the sea or a lake to reach an oil pool that lies beneath a point some distance off shore. By this method it is possible to put down a hole at the base of a hill to tap a pool that lies directly under the peak. Be it whispered, a crew capable of steering their drills may even tap the oil that lies beneath the land of another company, and thereby land in jail if virtue is triumphant.

Considering expense, the ability to drill a slanting or curving well, known to oil field engineers as deviant holes, is a great advantage. In country where it is necessary to drill through bodies of water, a common but expensive practice on the seacoast of California, along the Gulf of Mexico, and in some South American oil fields, it is now possible to sink several holes from one foundation.

In such instances a center hole is drilled as near the vertical as possible. Holes grouped about this center are directed in slanting or curving courses in their progress toward the oil target. By this method the entire oil-bearing zone lying within the limits of a given location may be explored from one central position. Holes slanting at 60° from the vertical are common in directed drilling. Others, "as crooked as a dog's hind leg," but useful in some instances, are not uncommon.

This new accomplishment, the directing of oil-well drills to great depths, is made possible to an astonishing degree of accuracy by means of various instruments which reveal the path of the drill as it bores its way into the earth. Like new developments in almost any field, directed drilling has raised its own problems. There is the nice little legal question which involves the drilling of holes which stray beyond the vertical limits arbitrarily established by the surface boundaries of a location. Legislation to curb drills which stray too far from the paths of righteousness has already been proposed.

▲  
*Mining sulphur under water has been successfully accomplished at Lake Peigneur, La., by sinking a well 700 feet below the bottom of the lake. The sulphur, liquefied by superheated water, is forced out by air pressure. Already 200,000 tons, 99.92% pure, have been taken from the wells.*

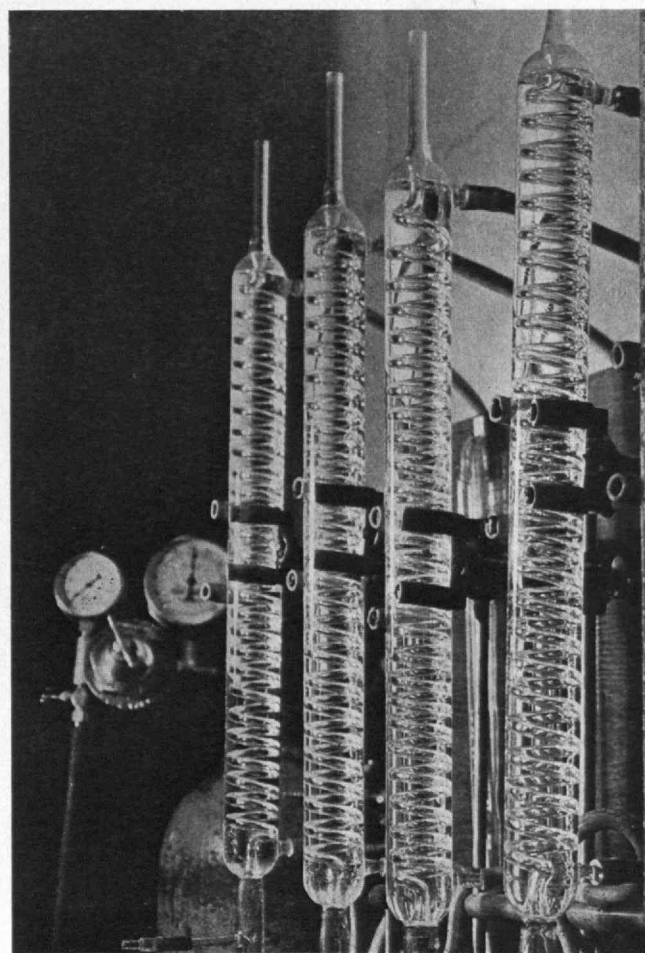
### Air Guide

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AMONG the items included in a credo of the modern sophisticate, as lately published in *Vanity Fair* ("What the Well-Dressed Mind Will Think"), is the statement that air travel is dull. For the sophisticate, reveling in a state of forced-draft ennui, it doubt-

less is. But need it be dull for the *intelligent*, percipient air traveler?

The question is pretty conclusively answered in a new type of *Baedeker* just published, entitled "Airways of America" (by A. K. Lobeck. Columbia University: The Geographical Press. \$2.50). Describing in a comprehensive manner the features to be observed along a transcontinental airway, this new guidebook is the forerunner of an entirely new literature on travel. With the help of such a guide, the air voyager may discern, in the map-like panorama of landscape forms below him, hidden significances and elusive beauty unapparent to those who must be bored at any cost.

Two things which impress the novitiate when flying are the absence of detail and the loss of relief in the landscape. How may he compensate for these losses? "This he must do by indirect means. The influence which the typography exerts upon types of vegetation and upon the activities of man renders it possible for the person in the air to interpret the phenomena which he observes in terms of topographic forms. For instance, the deeper green of forested areas may be taken as an indication of topography more rugged than where cultivated fields exist. The morainal belts of Indiana and Illinois reveal themselves not by their topography. Their hummocky surface is lost to the observer, even at a slight altitude, but the patches of woods, the lack of cultivated fields, the grazing land, often with flocks of sheep, the occasional lakes, the irregularity of the



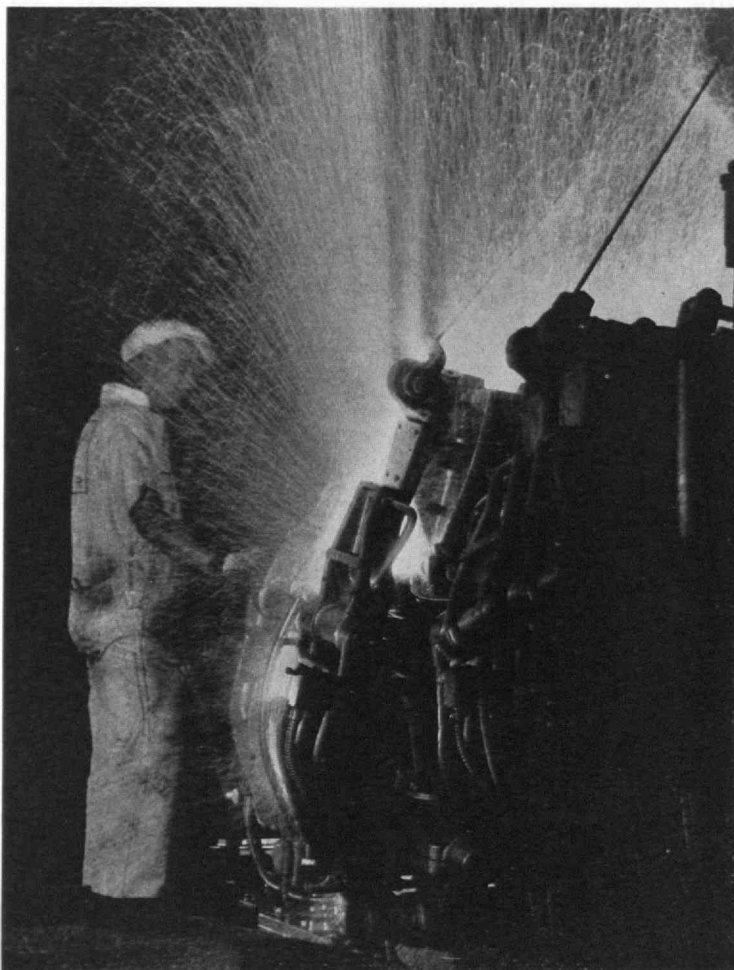
Geo. A. Douglas



roads, all of these things betoken a rougher landscape than the open country on either side with its straight roads and large farms. In other words, it is often the geographical rather than the physiographic aspect of a region which commands attention. Properly interpreted, these phenomena become the means by which the geomorphology can be deciphered. . . .

"When a flight is made at an elevation of a thousand feet or less above the ground, then many of the details of topography become apparent. Owing to the fact that most scheduled flights toward the west are made at a low elevation to avoid the strong westerly winds prevailing at high altitudes, it is obvious that much more is likely to be seen by the passenger going west than coming east. Eastbound flights are often made at elevations of a mile above the earth's surface, which is too high for the detection of many details. . . ."

This guide describes in detail the transcontinental route of the United Air Lines. The route is divided into 39 sections, and the geological and geographical aspects of every section are plainly and simply described by maps, drawings, photographs, and text. Supplementing the route descriptions are chapters on the physiographic provinces of the United States, the agricultural areas, the natural vegetation regions, climatic and seasonal aspects of the air route, operation of air lines, and preparation for an air trip.



Gerald Young

Flash welding as used in welding sheet steel shapes such as automobile bodies

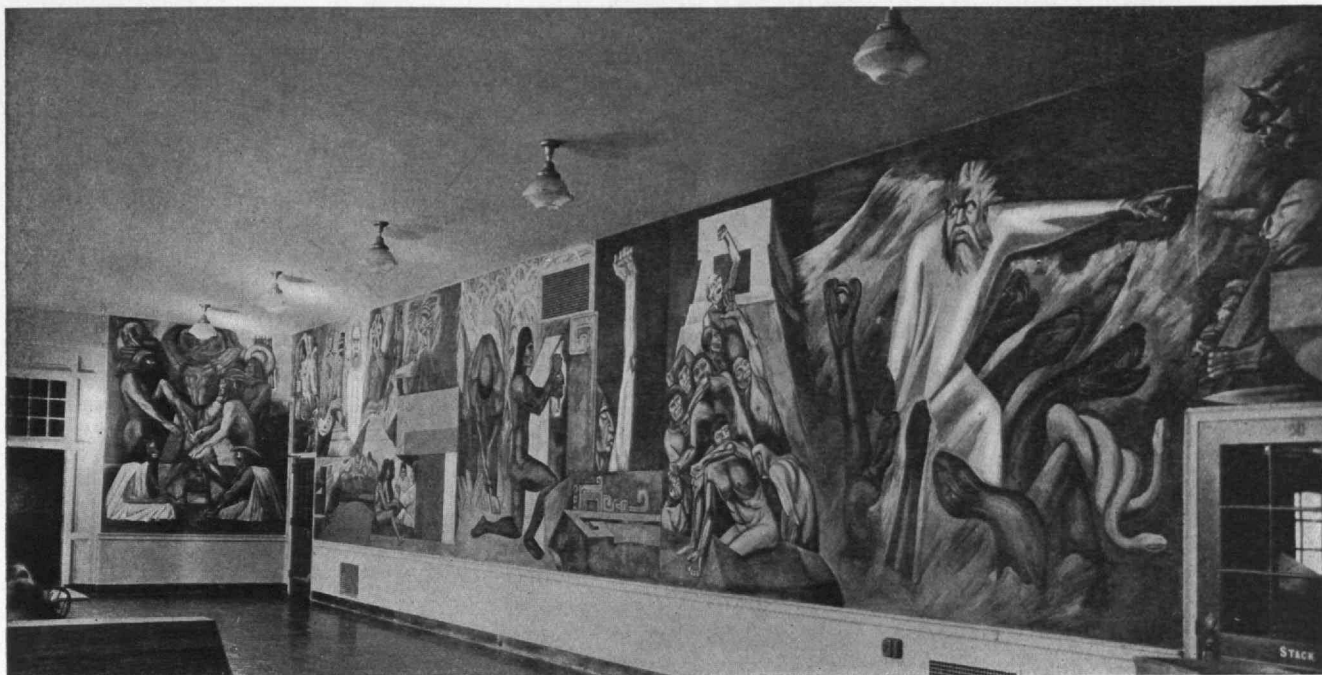
To the transcontinental air traveler, the book is indispensable, and to the inquiring layman it offers a pleasant and eminently understandable introduction to the fascinating sciences of geology and geography. It is a pity that most educated people know almost nothing about the geological and geographical aspects of their environment. This little book can open their eyes whether they be *dodos* anchored to the ground, or veteran travelers *upstairs*.

### Mural Decoration

GARDNER HALE, born in 1894 and recently deceased, achieved true greatness among fresco painters despite his youth, his brief life, and the fact that, an American, he was born into a milieu where fresco was uncommon. The recent posthumous publication of his big little book "Fresco Painting" (New York: William Edwin Rudge, 1933. \$2.50) must be of interest to all concerned with the arts and particularly to those who care for the arts of building. Fresco is particularly an architect's art. Frank Lloyd Wright tells us, "Nothing worth while will happen as great art until the architect is master of fresco and the fresco painter is master of architecture."

Although the book appears to deal almost entirely with the technique of a highly technical art, which it describes with lucidity, the implications of the text are so important that it ought to be widely read. Hale reminds us that fresco is the most permanent of the arts of interior wall-decoration. He shows how it was known in almost every great civilization and that we alone seem to have neglected it. We have had the opulence to build great buildings and to pay for their decoration. We have seldom had the foresight to demand great decoration for the millions of yards of wall space in our great buildings. The question raised is broader than that of fresco or no fresco. What, in fact, have we done about interior wall spaces? What might we have done? A frank survey leads to the inevitable conclusion that we have done precious little.

Wall decoration may be divided quite clearly into two classifications. The first and least significant of these is also, unfortunately, the most common. This consists of pasting on to the base wall a variety of decorative treatments which might be pasted on to anything. Within the group there is a wide range of mediocrity or excellence. The simplest of the veneers are thin slabs of stone, principally marble or travertine, slabs of wood, metal foils, or thin gauge metals. There have been advances in the manufacture of some of these materials. The newer wood veneers are very thin and strengthened by a cloth backing, thus permitting the use of elegant woods formerly too expensive. Metal foils are being made thinner and cheaper all the time and now may be obtained in a wide variety of lacquered colors. The field of metal foil wall decoration is hardly explored. There is precedent in the beaten gold walls of antiquity.



*Courtesy Dartmouth College*

*Section of fresco decorations in Baker Library, Dartmouth College, by José Clemente Orozco. It is one of the few examples in America of true fresco painting (see adjacent article)*

On a slightly higher plane, so far as organic quality is concerned, lie the various tile treatments. Tiles of mat or glaze finish, or of glass may be set in plaster or mastic in mosaic forms. Mosaic in its original small-scale form is definitely archaic and is perhaps not suitable for today's buildings, but with the glorious colors and finishes now obtainable, there is no reason why a larger scale mosaic painting might not be achieved. This might be reminiscent of Assyrian work but could definitely belong to 1933. The use of glass in a similar way would seem to open up alluring vistas to the enterprising artist. It scarcely need be said that we can make beautiful glass.

The standard mural painting done on canvas which is then stretched on the wall is, of course, familiar. Fresco painters have little use for it and it has neither the longevity nor the integral quality of fresco. But much can be done with the canvas mural. In this connection, while rubbers and linoleums have not been used much on walls, there seems no reason why they should not be used with success. They might be worked into geometrical designs utilizing the various colors in which they are available commercially. Better still, in neutral tones they might serve as the base for a new mural painting, a base on which new and unexpected effects might be obtained.

In the face of an integral and organic treatment of the wall as a wall, these superficial decorations pale. Fresco is the oldest of the nobler treatments. In brief, it is painting in wet plaster with pigments ground only in water. The painting is all done on the day the plaster is laid. The pigments sink into the plaster, lending a depth



*Burchard*

*Brick sculpture on façade of the Scheepvaarthuis in Amsterdam*

unobtainable by other painting methods. A fresco is almost as fully a part of the building it adorns as the structural frame itself. Modern technique, however, permits removal of a valuable fresco when the building has outlived its usefulness.

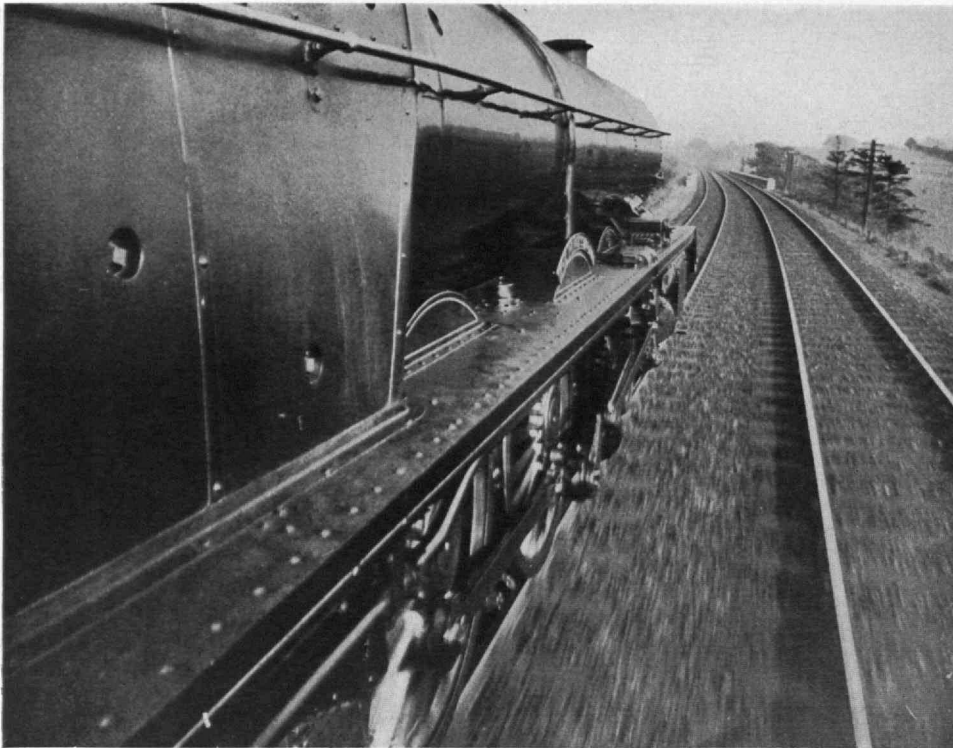
Fresco painting is a relatively slow process and, since it requires the almost continuous personal presence of the artist, it is costly. The art should undoubtedly have a renaissance and will presumably remain the most satisfactory method of decorating a wall. But there are other ways.

Where bricks can be used for the wall there are a number of possibilities which have by no means been exhausted. The various commercial bricks offer a palette of color with

which any artist may be content. The Batterymarch Building in Boston intimates the potential beauty that may be obtained in the use of bricks ranging from deep purple to light yellow. Thus bricks may be laid by masons in the ordinary bonds and patterns or even pictures developed merely by judicious color selection.

In Holland for the last 30 years, architects have been reminding us of the possibilities in brick sculpture. The Persians practiced the art of raised geometric brick-ornament to perfection. The Dutch have not been content with geometric forms but have gone on to pictorial sculpture in brick and tile. The Scheepvaarthuis in Amsterdam is a good example. Built some years ago by the combined enthusiasm of a number of young men, many of whom have since become individually renowned, this building is undoubtedly overexuberant and unduly influenced by Javanese art, but the details





*Vivid impression of speed and power as the Royal Scot hums along the rails towards Carlisle, England, at 65 miles an hour. The photograph was made from the footplate of the engine*

Acme

point the way to a new mural conception which is just as applicable to interiors as to exteriors. Finally, the frieze of the Peabody Museum at Harvard shows what may be done with a flat brick surface by sand-blasted relief or incised pictures. Color might also be introduced into this treatment.

Stone might be handled in a similar fashion. Moreover, the new art of photo-mural is suggestive. The photo-mural is an enlargement of a photograph to a very large scale on a material which is fastened to a wall. There appears to be no complete obstacle to the development of this process into enlargements directly on the stone or plaster of the wall. The fresco-painter will, of course, proclaim this a mechanical and undesirable thing, but the amateur photographer knows perfectly well that the exhibition photograph of today is not made merely by releasing a shutter.

Of course, none of these treatments will be of permanent artistic value to a nation unless they are keyed to the building which they adorn. The mural treatments of our buildings must reflect the purposes of the building, its locality, its period, and the aspirations of that place and time. "This is no imitation," proudly writes Orozco of his Dartmouth frescoes, "this is our own effort, to the limit of our own strength and experience, in all sincerity and spontaneity." The decorations of Radio City might have reached this ideal. That they failed to need not deter us from further aspiration.

We are apparently about to indulge in a large spree of government building. We may remain silent about the economic questions involved, but we clearly have a duty to demand that one of the results of this program shall be beauty. If we are to leave a legacy of taxes to posterity, we must also leave a legacy of art. One of the

least noticed arts offers one of the most enchanting possibilities, the art of mural decoration. Orozco thinks a revolution is necessary before we shall achieve the goal of great mural beauty. But this revolution need not be sanguine. It will be enough to forget smugness, to feel the fresh tide of ideas, to entertain these ideas bravely and boldly and to portray them with fertility of imagination and aesthetic courage.

### *Meshes of Power in Great Britain*

**T**HE Grid, England's national electrical development, to which virtually every power plant in England, Scotland, and Wales will eventually contribute its quota of energy, has been completed. Started in 1926 by an act of Parliament, and constructed at a cost of

approximately \$135,000,000, Great Britain's "five-and-a-half-year power plan" is of major import.

Under the direction of the Central Electricity Board, this vast power network entailed the building of 26,265 transmission towers from which are suspended 4,000 miles of wire, and its construction gave employment in one form or another to 200,000 British workmen in various industries. The primary transmission lines, which have a total length of 2,894 miles, carry electrical energy at 132,000 volts. Feeder lines are operated at 33,000 and 66,000 volts. New transformer design makes it possible to tap the high-voltage lines for the benefit of small groups of consumers in sparsely settled districts.

Every Englishman, his wife, and his children old enough to read know of the Grid. In its vast meshes of copper and aluminum lies the hope for cheaper power for industry and the home. All privately-owned power companies are to be hooked up to this national network. The government will pay them for their contributions of electricity. Industry and the people will buy their power from the Central Electricity Board. The system is expected to operate without benefit of subsidy. There have been criticisms of the project; the prospect of power for the humble consumer at rates lower than those of private corporations has been questioned. Its completion far ahead of schedule, however, at a cost below the original estimates, and the irreproachable administration of the Central Electricity Board, which asked and got five shillings a copy for its annual reports, have won the confidence of the people as a whole.

The Grid entailed not only the construction of a vast power system, but frequency standardization of all power companies and the changing over of all electrical driving machinery to meet the standard of 50 cycles



established for the entire system. This standardization has gone forward without interruption to service. At present, 2,500 miles of transmission lines are in operation. By the end of 1934 it is expected that the entire system will be operating. A year later it is estimated that the Grid will be transmitting power at 80% of its capacity, and that in 1940 it will be operating at full load.

The transmission towers of this huge network are of special interest. Most of them are from 70 to 80 feet high. The great steel pylons which carry the cadmium-copper-phosphor-bronze conductors over the Thames near London are 487 feet high, permitting a clearance for shipping of 250 feet above high spring tides. They are the largest of their kind.

▲

*The largest hydroelectric project in the Far East has been constructed on the Fusenko River in Korea. Its reservoir extends over an area of 9.3 square miles and has a storage capacity of 25,000,000,000 cubic feet; its power station contains four Pelton turbines generating 200,000 horse power under an effective head of 2,180 feet.*

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### Science en Masse

THOUSANDS of the country's leading scientists and engineers will gather in Boston and Cambridge during Christmas week for what promises to be the greatest meeting in the history of American science — the 93rd session of the American Association for the Advancement of Science. Preliminary plans for the meeting, which will be held from December 27 to 30, have been announced by Dean of Science Samuel C. Prescott, '94, chairman of the local committee in charge of arrangements.

The Association, which comprises 139 national scientific and engineering organizations, with a total membership of 20,000, will meet as the guest of the institutions of higher learning in Greater Boston, including Technology, Harvard University, Boston University, Boston College, Simmons College, Tufts College, Northeastern University, Wellesley College, Radcliffe College, and

Weston College. In addition to more than 3,000 members, the sessions will attract many more whose interests are affiliated with scientific developments.

Of international interest will be the award of the Rumford medal, the address by Henry Fairfield Osborn, former President of the American Museum of Natural History, and the annual Sigma Xi and Phi Beta Kappa lectures. In a symposium on "What Can Engineers Do for Agriculture?" public addresses will be made by the Hon. Henry A. Wallace, Secretary of Agriculture, and other high government officials.

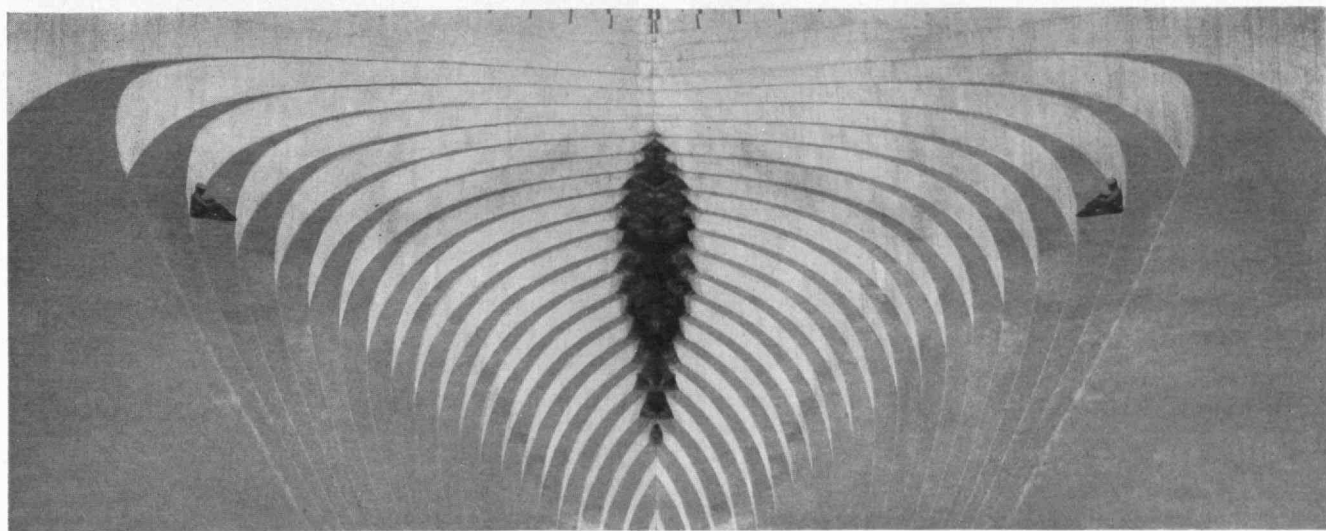
The latest discoveries in science and engineering, including research on the structure of atoms, and the development of high-voltage sources of electricity, will be discussed at technical sessions in which savants from many countries will participate. There will also be reports on the properties of the newly discovered "heavy water" and developments in medical as well as other widely distributed fields of research.

This is the fifth meeting of the Association in Boston, the last having been held in December, 1922. Most of the sectional meetings will be held at Technology and at Harvard. At the latter institution there will be a great exhibition of newly developed scientific apparatus in Memorial Hall. Headquarters for the meeting will be at the Hotel Statler, Boston, where the first general session will take place.

President Compton is serving as honorary vice-chairman of the local committee, while Dr. A. Lawrence Lowell, former President of Harvard, is honorary chairman. Committee officers include: Dr. Prescott, chairman; Dr. Kirtley F. Mather of Harvard, vice-chairman; Professor A. L. Townsend, '13, of the Department of Mechanical Engineering at the Institute, Secretary; and H. L. Shattuck, Treasurer of Harvard, Treasurer.

▲

*One hundred years ago last month De Moivre, French refugee in England and friend of Sir Isaac Newton, laid down the basis of the "normal probability curve," thereby initiating the fertile mathematics of probability. It was he who first developed the method for calculating annuity rates. De Moivre eked out a living by computing odds for professional gamblers. It is significant that actuarial mathematics received its impetus from gambling.*



Htromu Ktra

# THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

## *The President Reports*

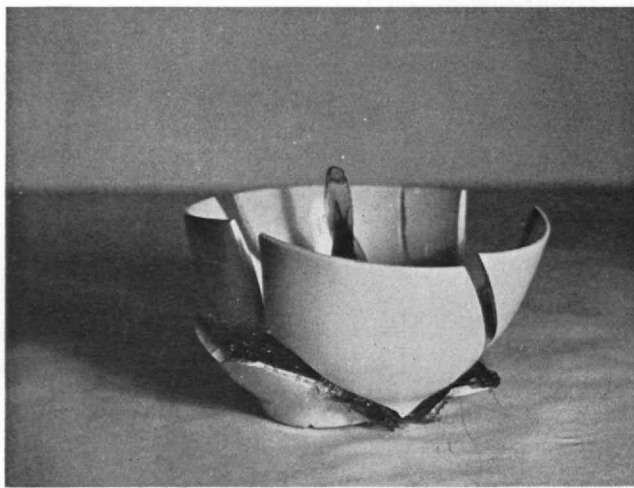
**I**MPORTANT trends in Institute affairs not fully discussed in Technology news of the past year are indicated in the following excerpts from President Compton's recent report to the Corporation:

"If the Institute is to attract, from the entire country and indeed from the entire world, those students best qualified to profit from its unusual advantages, the way must be made easier for capable students of limited financial means. A great step in this direction was taken with the establishment of the Technology Loan Fund, and this has proved to be exceedingly helpful in the present emergency. Loans of \$204,014 were made last year to students carefully selected for need, promise, and reliability. . . . Scholarship and fellowship funds granted to students during the past year amounted to \$136,474. . . . The student employment service estimates that the earnings of students on temporary employment while pursuing their studies during the past academic year amounted to \$28,617. It thus appears that a total of \$369,125 was received by students during the past year in loans, scholarships, and earnings, in addition to summer earnings which are difficult to estimate. This is more than 25% of the total amount — \$1,437,000 — received by the Institute from students for tuition and fees. . . .

"The Faculty is keenly alive to its responsibility in continuously improving the pedagogical processes of the Institute. Plans for special treatment adapted to the unique needs of outstanding students have received particular attention. . . . For some years we have gained experience in this regard through the operation of honors groups in a few departments, notably in Electrical Engineering. The results of this experience have been

sufficiently promising to convince the Faculty that a similar procedure may well be extended throughout the Institute, and this has been provided for under the control of a faculty committee. The amount of freedom which exists in the educational career of a student of ability is not always appreciated by those who know the Institute only slightly. There is a choice among about 40 formal courses of study, and the present arrangements allow this choice to be made deliberately by a student as he proceeds through the Institute. Moreover, there is a provision whereby a student who wishes to study along special lines may arrange his own plans with the approval of a faculty committee. In addition, in any department where the honors group system is in operation, an outstanding student is given advantageous freedom in his manner of handling subjects of instruction, together with special conferences and the advice of counselors. Another aspect of our work which is not apparent on casual inspection is the emphasis which the Faculty places upon subjects of a broadening nature. These so-called cultural subjects, together with those required studies of language and fundamental science which are usually considered as among the strongest broadening subjects of liberal arts education, comprise a very significant portion of the typical student's program. . . .

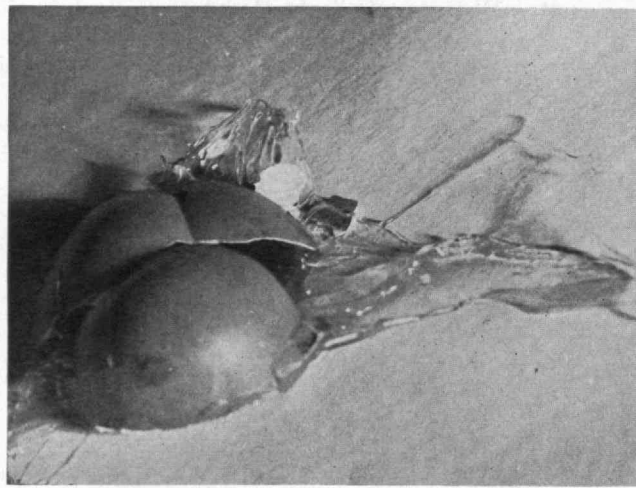
"The Institute's position as the outstanding institution of its kind in the country offers an opportunity and imposes an obligation to be of service in public matters, especially in connection with the State of Massachusetts and the Cities of Boston and Cambridge. Aid is continually extended to these two cities in their problems by the various departments of the Institute, and appears to be much appreciated. . . . Under executive order by President Roosevelt, there has been formed a Science



M. I. T. High-Speed photos by Harold E. Edgerton, '27, and Kenneth J. Germeshausen, '32

**Plunk!**

*When a cup filled with coffee is dropped by the clumsy waiter, this is a split-second photograph of what happens on the floor*



M. I. T. High-Speed photos by Harold E. Edgerton, '27, and Kenneth J. Germeshausen, '32

**Plop!**

*And this is what happens when a freely falling egg meets resistance. Both pictures show details which the eye never sees*

Advisory Board for study and report upon the science services of the Federal Government. The President of the Institute is the Chairman of this Board, which is actively coöperating with government officials in planning for improved service and organization of the leading scientific bureaus, and is preparing recommendations of a more effective general policy of the government with respect to scientific work. . . .

"The Technology Press of the Massachusetts Institute of Technology has recently secured patent rights on the name 'The Technology Press.' During the past year it has published three books: 'Textile Research: A Survey of Progress'; 'The Theory of Functions As Applied to Engineering Problems'; and 'The Evolving House: A History of the Home,' Volume I, by our fellow member Mr. Bemis, and his associate, Mr. Burchard. There are also in process of publication a book on pumps and turbines, one on waterway engineering, and the second volume of 'The Evolving House.' . . .

"A particularly important aspect of the Institute's public relations which is at the same time a family affair for its own constituents, is the unusual number of contacts which have been made during the past year directly with alumni clubs. . . .

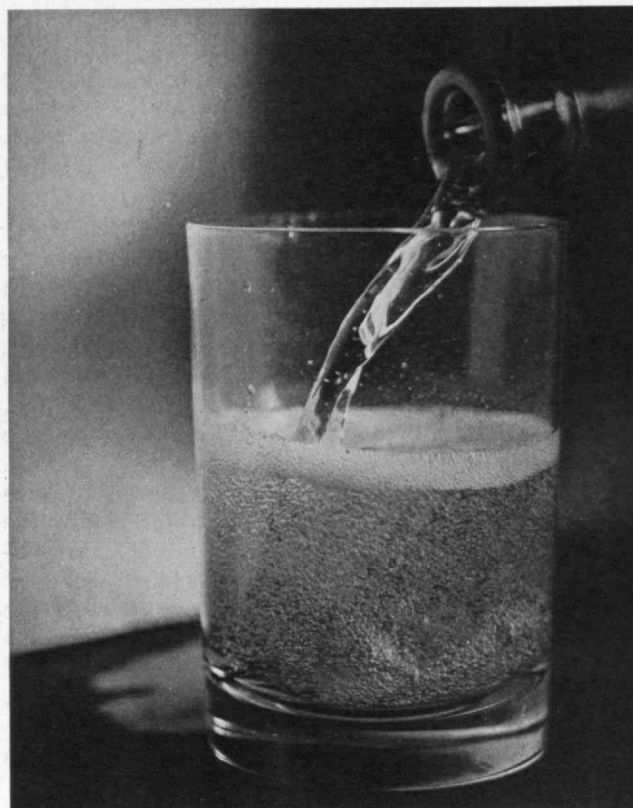
"It is impossible here to mention all of the research work by students and staff of the Institute which is adding prestige, contributing to human welfare, and at the same time providing a most valuable adjunct to the educational program of the Institute. This educational value is directly felt by those who participate in the work and is indirectly felt by the stimulus given to the entire body of staff and students. . . .

"It may truthfully be said that the general situation is very satisfactory and the outlook most encouraging. To be sure, a number of important projects are being held in abeyance and the majority of the extensions of the Institute's work, which were recommended in the last report of our late colleague, Dr. Stratton, and in my report of two years ago, remain unaccomplished. On the other hand, the Institute is operating with an efficiency and enthusiasm and a spirit of idealism which are far more important than additional laboratories or endowments, and real progress has been made even through this depression in the quality of its educational processes and the importance of its fundamental contributions to knowledge and to human welfare. With this background and with the loyal coöperation of the staff, there is every reason to look with confidence to the future."

### *Lines from the Sun*

NOTABLE progress toward the solution of an astronomical mystery which has puzzled scientists for 60 years — the identity of the element causing the sun's corona — is seen in recent investigations by Dr. Joseph C. Boyce, Research Associate in the Institute's Department of Physics, and Dr. Donald H. Menzel, Assistant Professor of Astronomy at Harvard University.

Spectroscopic studies by Drs. Boyce and Menzel indicate that the corona, the spectacular glow seen emanating from the sun during total eclipses, has its



M. I. T. High-Speed photos by Harold E. Edgerton '27, and Kenneth J. Germeshausen, '32  
The high-speed camera reveals unnoticed yet commonplace beauty:  
ginger ale being poured into a glass

chief source in neutral oxygen atoms in a peculiar state of excitation. The coronal radiations have long been attributed to an hypothetical element, coronium, unknown on earth.

In the course of the investigation, which is still in progress, three of the strongest lines of the coronal spectrum were identified with the neutral oxygen atoms in the high solar atmosphere. It is thought that, with this important start, other coronal lines may be interpreted. Solution of the problem was greatly aided by the recent discovery at Mount Wilson that the new star, Nova Ophiuchi, also shows coronal lines at one stage in its explosive outburst.

First observations of the spectra of the corona, whose rays stream out from the sun for millions of miles, were made more than 60 years ago, but the source of the peculiar light has until now been one of the mysteries of science.

### *1933 Enrollment*

OFFICIAL figures disclosed by Registrar Joseph C. MacKinnon on November 1 showed a total student enrollment of 2,606, a decline of 225 from the total for the same date last year. A study of registration by years reveals that the entering class, with a total of 485, decreased 77 from last year. Second year enrollment is 39 under that of 1932, and a decline of 93 is noted in the junior class. Senior registration increased by 11, while the Graduate School, with 530, dropped by 27. This year's enrollment is more than 200 greater than estimates made last summer.



## Short Waves Aloft

AMATEUR radio operators in this country and Canada are coöperating as auditors in a unique series of short wave broadcasts from Technology's meteorological airplane on its daily flights to a height of nearly four miles over Boston.

In what is considered by the American Radio Relay League to be the most important study ever made of the behavior of ultra-high-frequency waves at known altitudes, vocal messages are transmitted every morning on a wavelength of five meters, at intervals of 500 feet, from ground level to the plane's ceiling of 20,000 feet.

The "flying laboratory," piloted by Henry B. Harris, leaves the East Boston Airport at 7:30 o'clock each morning on its regular flight to secure weather data. On his outbound trips, Pilot Harris reports meteorological findings direct to the Institute's station atop the Daniel Guggenheim aeronautical laboratory. Descending, special messages are broadcast for amateurs.

The special transmitting apparatus necessary for the investigations was installed in the weather plane with the coöperation of Ross A. Hull, short wave expert of the American Radio Relay League. Professor C. G. A. Rossby and Dr. Karl O. Lange of the M. I. T. meteorological division are directing the program, and radio operators Ethan A. Murphy and Frank A. Arsenault are coöperating at the Institute's station.

## Graduate Center

TECHNOLOGY'S new Graduate House, considered one of the most progressive developments in Institute student life in many years, is rapidly taking its place as a recognized center of graduate activity. A series of generous gifts and appropriations recently have made possible noteworthy additions to the new unit's equipment.

An anonymous gift of \$1,000 to the Crafts Library was announced at the weekly dinner of graduate students in Walker Memorial on October 18. The sum will be used to purchase a special collection of books on the history of science, technology, and architecture, and the biographies of leaders in those fields. It will also provide a number of scientific reference books and dictionaries.

An appropriation of \$1,000, voted by the Executive Committee of the Corporation on October 24, will make possible the addition of many works of general cultural interest in such fields as philosophy, sociology, economics, poetry, drama, and fiction. Each volume will bear a bookplate especially designed for Crafts Library by Professor Harry W. Gardner, '94.

Dean of Architecture William Emerson has undertaken to select several fine etchings, Japanese water colors, and prints for the house. A valuable old map of a portion of the West Indies was recently presented by Dean of Students H. E. Lobdell, '17.

Guest speaker at the weekly dinner of graduate students on October 18 was Dr. Jerome C. Hunsaker, '12, Head of the Department of Mechanical Engineering, who discussed some of the problems arising from efforts to control national economy. The following Wednesday, Professor Julius Stratton, '23, related his

experiences in the jungles of Ecuador last summer. On November 1, Dr. Wilson G. Smillie of the Harvard School of Public Health told of an expedition through the Brazilian interior.

A tea was held at the Graduate House on Sunday afternoon, October 29, for Institute officials, faculty members, graduate students, and their guests. Similar gatherings of an informal nature are being planned for the winter.

## Science for the Iron Horse

A COMMITTEE to coöperate with railroad officials in determining whether the efficiency of their lines can be increased by further scientific research was recently appointed by the Science Advisory Board of the National Research Council, at the request of Joseph B. Eastman, federal coördinator of transportation.

Named to the committee of ten were three Technology men, Dr. Frank B. Jewett, '03, President of the Bell Telephone Laboratories, Chairman; Maurice Holland, '16, Director of the division of engineering and industrial research, National Research Council, Director; and Professor Dugald C. Jackson, Head of the Institute's Department of Electrical Engineering.

In a letter to Dr. Compton, Chairman of the Science Advisory Board, Mr. Eastman stated that the success of scientific research by various industries led him to the belief that much might be done to avoid waste and preventable expense by the railroads. Dr. Compton declared that the suggestion fell in line with the result of a preliminary survey which had raised the question whether the railroads were taking adequate advantage of the opportunities and methods of applied science.

## Portrait to the Antipodes

TEN years before the late President Richard C. Maclaurin undertook the task of building a Greater Technology, he was engaged in an earlier academic venture on the opposite side of the world. When Victoria University College was founded in Wellington, New Zealand, in 1899, Dr. Maclaurin joined the staff as one of the first four faculty members. Pioneering first as Professor of mathematics, he later taught law and served as Dean of the Faculty of law.

This autumn, friends and alumni of Victoria College undertook to commemorate the work of their four foundation professors in a series of portraits to be hung in the college library. Apprised recently of the plan, the Institute's Corporation voted to present Victoria College with a copy of Frank W. Benson's fine oil portrait of Dr. Maclaurin, which now hangs in the President's office at the Institute. The copy will be made by Leslie P. Thompson and immediately upon completion shipped to New Zealand, where it will hang as a memorial to the earlier achievements of a great educator.

## Aldred Lectures

FUTURE applications of electric power in "The Next Great Boom" were described by C. M. Ripley of the General Electric Company in the first of the 11th series

of Aldred lectures on November 17. He also discussed important principles of vocational guidance.

A group of distinguished educators and industrialists will speak on timely subjects in forthcoming Aldred lectures during the year. Dr. A. E. Kennelly, Professor Emeritus of Technology and Harvard University, on December 8 will describe "The Relations of Engineering to Our Modern World."

"The Cultivation of Judgment" will be analyzed by E. C. Mayo, President of the Gorham Manufacturing Company of Providence, in the third lecture of the series on January 19. Dr. Harlow Shapley, Director of the Harvard College Observatory and member of Technology's Corporation, on February 18 will give an illustrated address on "Engineering Problems and Practice in the Construction of Galaxies."

Concluding the series on March 16 will be a lecture by R. E. Flanders, President of the Jones and Lamson Machine Company, on "The Future of Business Enterprise."

### *Salary Reserve Fund Closes*

**I**MMEDIATE discontinuance of the salary reserve fund and the return of all contributions was announced by President Compton on October 19.

The salary reserve plan, characterized by college administrative officers throughout the country as a model method of forestalling financial contingencies, went into effect in November, 1932, and was renewed last July. Under it, members of the staff and employees contributed 10% of their salaries to a fund which was held in readiness to protect the Institute against a possible serious deficit in the year's expenses.

Discontinuance of the plan was made possible by the Institute's improved financial outlook. It is now thought improbable that a deficit will be incurred this year unless business conditions take an unexpected turn for the worse, in which case the reserve plan may be resumed.

In his announcement, Dr. Compton said, "This action is due in a large part, first, to the splendid coöperation of the staff in avoiding unnecessary expenditures, and, second, to the gratifying increase in enrollment above that which was indicated by student registration early in the summer."

### *Appointments*

**T**HE appointment of Captain James F. C. Hyde, U.S.A., as Assistant Professor of Military Science and Tactics at the Institute, has been announced.

Captain Hyde is a graduate of Colorado College in the Class of 1916. The following year he entered the army as a reserve officer, and was graduated from the Army Engineer School in 1926. In 1930 he completed the course of the Command and General Staff School at Fort Leavenworth, and in 1931 was graduated from the Air Corps Tactical School.

Other appointments announced recently include: Mrs. C. B. Armstrong, '35, as Assistant in the Department of Chemistry, under the provisions of the Ellen H. Richards Fund; Leonard D. Christie, '31, Industrial Research Fellow, Division of Industrial Coöperation;

Harold A. Freeman, '31, Assistant in the Department of Economics and Statistics; Edwin R. Gilliland and William C. Kay, Research Fellows in the Department of Chemical Engineering; and Chaim L. Pekeris, '29, Research Assistant in the Department of Geology.

### *Physicist Franck*

**J**AMES FRANCK, distinguished German physicist and former Head of the Physical Institute of the University of Göttingen, will be the guest of the Departments of Physics of Technology and Harvard for a series of lectures during December. Professor Franck was awarded the Nobel prize in physics in 1926.

### *Academic Tours*

**P**ROFESSOR James L. Tryon, Director of Admissions, recently returned from a three weeks' tour of 30 colleges, universities, and preparatory schools in Virginia, Maryland, and the District of Columbia, where he delivered a series of addresses on "Preparation for the Technical Professions." In Washington, Baltimore, and Wilmington he was the guest of groups of Technology alumni.

During the last two weeks of October, Dr. Tryon visited universities and colleges throughout the Maritime Provinces of Canada.

### *Foreign Students' Dinner*

**P**RESIDENT and Mrs. Compton entertained foreign students and foreign members of the instructing staff at a dinner at their home on Charles River Road on the evening of November 11.

There are 180 foreign students representing 38 countries now enrolled at Technology, while 26 members of the staff come from abroad.

Assisting Dr. and Mrs. Compton were the Dean's hospitality committee, of which Mrs. J. R. Jack is chairman, and those members of the Institute Matrons' Association who are this year acting as hostesses to foreign students.

### *Miscellanea*

¶ Vice-President Vannevar Bush, '16, presided at a research symposium held as part of the fourth annual meeting of the United States Institute for Textile Research in New York on November 2.

¶ In an address on "Locomotive Miles," Mr. L. K. Sillcox, Vice-President of the New York Air Brake Company, discussed on November 3 the development, present status, and future trends in railway equipment. He will speak at the Institute again on December 1, both addresses being sponsored by the Department of Mechanical Engineering.

### *Exchange Professorships*

**B**EGINNING next autumn, the Institute will inaugurate a general plan for the exchange of professors with other educational institutions in this coun-

try as well as abroad. This plan grew out of a suggestion made by Professor Dugald C. Jackson, Head of the Institute's Department of Electrical Engineering, in a paper presented before the Society for the Promotion of Engineering Education in Chicago last summer. Its purpose is to broaden the experience, acquaintance, and educational outlook of members of the faculty, and to disseminate quickly and widely the best educational methods as they are developed in the various institutions.

The exchange will be of mutual benefit to the cooperating institutions, President Compton believes, since each may take and apply whatever of advantage it learns through this personal contact with the other. Furthermore, this plan will tend to overcome any tendency in institutions to become ingrown or isolated by providing new contacts with outside personalities and ideas.

The plan provides for such an exchange arrangement each year for one member of the staff of each of the departments of study in the Institute, embracing the fields of science, engineering, architecture, and humanities. The nominations to these exchange professorships will be made by the heads or deans of corresponding departments in the cooperating institutions. Each institution will continue to pay the regular salary of its professor, while on leave. In addition, it is proposed to add a modest supplement to the salary of each of the professors involved in the exchanges, in view of special expenses of travel and of temporary living arrangements. Such exchange arrangements may be made with any educational institution in this country or abroad, and also with industrial research laboratories.

In general, it is planned to limit these exchange appointments to men who still have years of active service ahead of them, yet who have already achieved some distinction. The first appointments will begin with the next academic year.

### Technology Business Conference

FOR the past two years the Department of Business and Engineering Administration has been holding an Annual Business Conference on New Year's Day, for the benefit of the graduates of Course XV. At these conferences, questions relating to the business situation and conditions have been discussed.

The Department plans to open the oncoming conference to all of the Technology alumni in New England. The general topic will be "Industrial Problems under the Recovery Act," and the program is as follows:

10:00 a.m. *Code Problems* — Dr. Wilson Compton (brother of President Karl T. Compton), Secretary and General Manager of the National Lumber Manufacturers Association, Washington, D. C.

11:30 a.m. *Price Problems* — Robert F. Elder, Assistant Professor of Marketing, Department of Business and Engineering Administration.

1:00 p.m. Luncheon.

2:00 p.m. *Current Financing Problems* — Floyd E. Armstrong, Professor of Political Economy, Department of Economics.

3:30 p.m. *Problems of the Small Manufacturer* — Erwin H. Schell, '12, Professor of Business Management, Department of Business and Engineering Administration.

In order that these papers may deal directly with the more pressing and immediate situations, alumni are invited to send at once to Professor E. H. Schell, M. I. T., any specific topics which they would like to have discussed under each or all of the above headings. In the event that they have suggestions for more than one topic, the individual suggestions should be placed on separate sheets so that they may be referred to the speakers.

Those planning to attend should inform Professor Schell. There will be a registration charge, which includes a luncheon ticket, of one dollar.

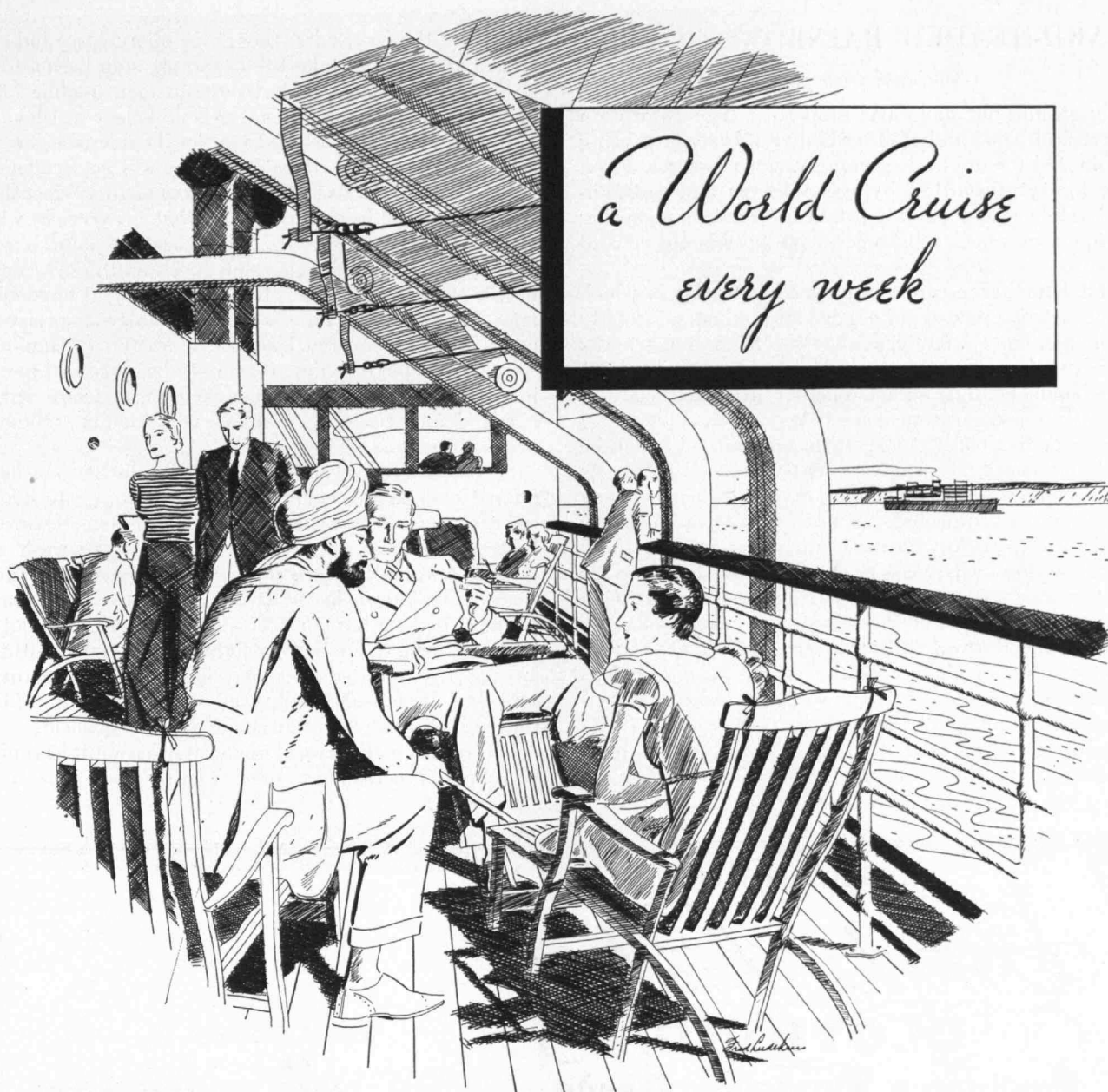
### Council Meeting

WITH a record-breaking attendance of 94, the Alumni Council, meeting for the 168th time, gave its new President, Redfield Proctor, '02, a rousing welcome on October 30. After a hearty dinner, during which President Compton, as salad orator, reported on the highly satisfactory progress of the Institute, the Council took up an agenda which included introduction of new members, felicitations to incoming and outgoing Term Members of the Corporation, presentation of new faculty members, and consideration of reports from officers and committees.

Of the reports presented the *pièce de résistance* was the report of the committee appointed last year to devise ways of stimulating activity among Boston alumni. This committee, consisting of Clarence M. Chase, '32, John C. Damon, '05, Humphrey M. Haley, '04, Royal B. Wills, '18, and Leicester F. Hamilton, '14, *Chairman*, presented through its chairman recommendations which may be briefly summarized as follows:

1. That all alumni residing within 25 miles of Boston be included in the Boston district (about 4,000).
2. That this district be divided geographically into sections, each representing approximately 100 alumni.
3. That one member of the alumni from each of these sections be appointed by the Executive Committee of the Council to represent the section for one year with the privilege of attending the regular council meetings without vote. (These representatives may also be members of the present Council.) That these representatives should be selected for their loyalty, interest, and aggressiveness, and for their willingness to cooperate in stimulating interest, particularly among the members of their district; that they be supplied with lists of M. I. T. men in their district, that they cooperate with the Secretary of the Council and the Editor of *The Technology Review* and serve in the general capacity of representatives, as the Council shall direct, and that these representatives cooperate with a special committee of the Council (proposed later in this report) which will act as an advisory authority to appoint as many assistants as they may require within their district and should be encouraged to make suggestions as to their successors.
4. That there be at least two general meetings of the Alumni of Greater Boston (*Continued on page 114*)





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## HARD-HEADED RAINBOW CHASERS

(Continued from page 89)

only atomic but molecular properties. The absorption spectra of blood and of other body fluids are now being calibrated for use in diagnosing various diseases. From the light transmitted by green leaves and autumn-tinted foliage has come important information regarding complex chemical substances such as chlorophyll and carotin.

That further research may reveal new ways in which the spectroscope can aid science and industry is highly probable. Only a few years ago the Raman effect was discovered, which gives important information about the bonds holding atoms together in molecules, and recently a large user of insulating oils was enabled, by means of this effect, to show that certain oil which he had purchased as new was in fact second-hand, its molecules showing the effects of the strains to which they had been subjected. No up-to-date organic chemist can afford to neglect the use of such a powerful method.

A few firms with very progressive executives are far in the lead in making use of the spectroscope. One company was cited at the recent conference as having photographed over 33,000 spectra in its production control program. The small initial outlay required to purchase spectroscopic equipment and the cost of upkeep are saved many times a year in this plant. In no case in which this modern method of analysis has been installed have I ever heard of dissatisfaction being ex-

pressed with the results, though in many cases industrialists hesitate to take the beginning step because of their fear of being unable to obtain men qualified to handle the equipment. This fear is no longer justified.

Here we have the answer to one of the questions most frequently asked the educator: Where will your college-trained men find jobs? At each time in history when the recent graduate begins to despair that his services will ever be needed by society, the saturation point is removed by some new expansion in human desires and needs. A field which seems to be offering great opportunity at the present time is that of industrial spectroscopy. Men who have at least the rudiments of training in spectroscopic technic are going to be more and more in demand during the next few years, while those with a sound and thorough training will command fancy prices.

So far as I am aware, up to now no institution has offered courses especially designed to train industrial spectroscopists. Many excellent spectroscopic research laboratories exist, but the training they furnish is usually designed to turn out scientists capable of furthering our knowledge of atoms and stars rather than of more prosaic human necessities. Feeling that both types of training are of great importance, the Institute has recently initiated a series of lecture and laboratory courses in practical and applied spectroscopy in addition to its regular scientific curriculum in this field.

On account of the present financial situation, it has only been found practicable to offer (Concluded on page 112)

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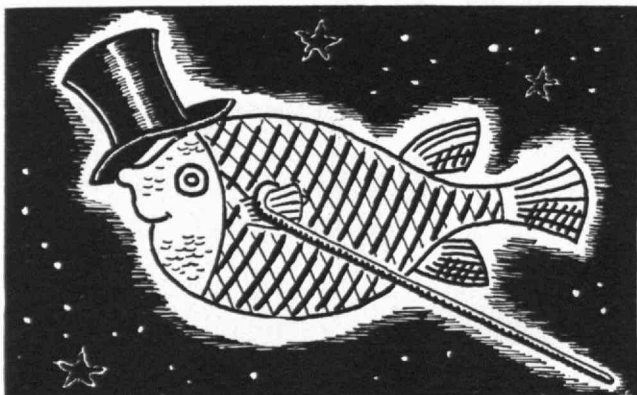
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## HARD-HEADED RAINBOW CHASERS

*(Concluded from page 110)*

laboratory work in industrial spectroscopy during the summer, when it is possible to use the equipment needed for other courses during the main school year. The response to the first offering of this work was very satisfactory, and further courses of the kind are to be scheduled next summer. In the meantime, at the request of students in various departments dealing with fields where the spectroscopy has been found useful, a regular lecture course is being given on applications of spectroscopy to analytical processes. From the response to this course, it appears probable that about 50 students per year can be expected to show interest in this work, and it is hoped that laboratory facilities may soon be available to supplement the lecture work.

In the meantime, research and instruction in the field of pure spectroscopy and its applications to problems in physics, chemistry, and astronomy is proceeding. The spectroscopy laboratory has now been in operation for two years, and a number of inventions and discoveries have already been made by members of its staff, while several important investigations which will require a period of years to complete have been initiated.

When this spectroscopic program is in full swing, then, it is expected that it will consist of three main branches: instruction and research in spectroscopy for its own sake; training in practical and applied spectroscopy for routine use by chemists, biologists, and so on, and training of industrial spectroscopists; and coöperation with industry in investigations of problems pertaining to the development of spectroscopic methods for their use. At present it is possible to have routine qualitative analyses made in the Institute laboratories at cost, and it is hoped that this service can be extended to include quantitative measurements before long.

Next July has been tentatively set as the date for a second spectroscopic conference in the Institute laboratories, and it is hoped that it may be as successful as the first.

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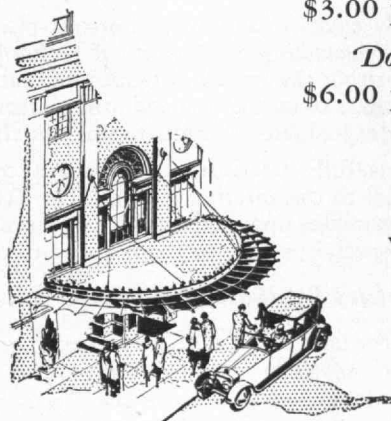
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## GIANTS AND DWARFS

*(Concluded from page 96)*

platelets or epiphyses consolidate with the proximal end of the adjacent bone does growth possibility disappear. As such epiphyseal closure is progressive and selective, it has been possible as the result of extensive radiographic studies to ascertain the approximate age at which epiphyseal fusion of individual structures normally transpires. Thus we may define the so-called bone age for a given individual in terms of his characteristic pattern of epiphyseal closure in relation to the normal pattern for a given chronological age. In our studies of the little people it was noteworthy that epiphyseal closure had been greatly retarded and that the potentialities of further growth still existed in the majority of the group. Lacking, however, as they patently do, the necessary stimulus of endogenous origin, further spontaneous growth of any considerable degree is not to be anticipated. The result of the use of the potent growth principles derived from other animal sources and today in small amount, at least, an article of commerce, must remain problematical with this group. With those demonstrating retarded growth in childhood and adolescence, already the application of this powerful preparation has yielded tangible, positive results. Scientific medicine of today with but little stretch of the imagination can be conceived of as developing a Procrustean bed of hormonal agencies through which in time it may be possible to reduce an entire population to a dull level of physical uniformity. Thus in one tiny chapter science may produce a minor justification of the wholly inexact statement which initiates the Declaration of Independence. Such a condition, however, can not be regarded as imminent even by the most optimistic of standardizing agencies.

## THE INSTITUTE GAZETTE

*(Continued from page 108)*

(exclusive of the annual Alumni Dinner) held each year in Walker Memorial, these meetings to be sponsored by the Committee on Assemblies; that they be inexpensive and self-supporting as far as possible; that each of the meetings should be arranged by a different sub-committee of the Committee on Assemblies appointed for the purpose so that there may be some competition and new ideas and interest aroused in these affairs, particularly as regards attendance; that the district representatives of the Council should stimulate interest in these meetings within their districts; that a record of attendance at these general meetings should be kept and an attempt made to gather more information as to the particular interests of those attending and to gather information for the general files of the Institute; that at these general meetings those attending should be encouraged to meet by M. I. T. courses or by geographical districts for such light refreshments as might be served.

5. That a sub-committee of five members be appointed each year to act as an advisory committee to the Commuters' Association of M. I. T., an undergraduate activity which has recently been organized to promote Institute spirit and better acquaintance among the undergraduate commuters. The association has been formed by a sub-committee of the Institute Committee along the same general lines as proposed for the alumni of greater Boston and will be represented on the Institute Committee. If properly directed, the Commuters' Association of M. I. T. can be depended upon to organize local community groups for *(Concluded on page 118)*

## INFORMATION

**T**HE TECHNOLOGY REVIEW BUREAU exists to supply authoritative information to anyone interested in details regarding the Massachusetts Institute of Technology. It serves as a clearing house for inquiry and aims to further the spread of exact information regarding entrance requirements, outline of courses, subjects of instruction and other information which may be of aid to the students considering undergraduate or graduate study at the Institute.

The Institute publishes a variety of bulletins, fully descriptive of individual courses, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

*Ask for the following circulars by their descriptive letters:*

**AB:** For general information, admission requirements, subjects of instruction, ask for Bulletin AB.

**C:** For announcement of courses offered in Summer Session, ask for Bulletin C.

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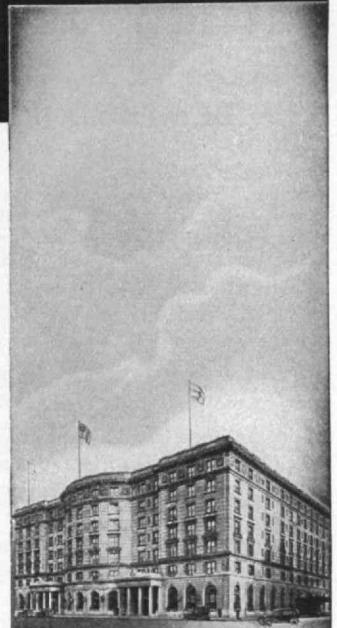
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2. Pylon of Building One
3. Dome from Eastman Court
4. Walker Memorial
5. President's House
6. Pratt School of Naval Architecture and Marine Engineering
7. Rogers Building on Boylston St.
8. Dormitories in Rear of President's House
9. Runkle Hall — Dormitory Group
10. West Pylons in duPont Court
11. Lowell Court
12. Mercantile Building, Summer St., Boston, Where Technology Began Its Work February 20, 1865

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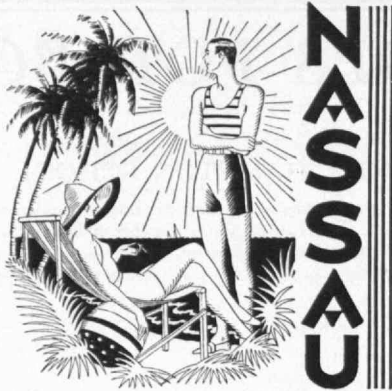
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## THE INSTITUTE GAZETTE

(Concluded from page 114)

joint meetings with the Alumni. The district representatives of the Council and the local representatives for the Commuters' Association should coöperate in these local meetings.

The report prompted a vigorous discussion, the gist of which was affirmation. The Council, therefore, voted that the report be accepted and referred to the Executive Committee to be revised as deemed necessary and put into effect.

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# ADVERSARIA

## SAB, NRA, PWA, and M. I. T. (Continued)

¶ FRANK B. JEWETT '03, MAURICE HOLLAND '16, and DUGALD C. JACKSON, Head of M. I. T.'s Electrical Engineering Department, have been appointed to a committee of ten, of which Dr. Jewett is chairman, selected by the Federal Government's Science Advisory Board (President Compton, Chairman) to co-operate with a similar group of railroad officers. Their purpose is to determine whether efficiency of the railroads could be increased by further research.

¶ For the past two issues The Review has published the names of alumni working for the emergency administration in Washington. The list continues with these new names: Interior Department, PWA — FRANK P. MCKIBBEN '94, JULIUS E. NOLTE '98, RICHARD O. MARSH '05, ARTHUR L. SHERMAN '06, WILLIAM H. MARTIN '07, BION A. BOWMAN '09, CHARLES P. KERR '11, WILLIAM C. MEHAFFEY '17, BENJAMIN F. THOMAS '13, BENJAMIN W. THORON '22. ADOLPH H. FEIBEL '32 has been with the Code Analysis Division of the NRA as an examiner and is now an assistant to Mr. Whiteside; Dean E. A. HOLBROOK '04 is Technical Adviser of the National Recovery Board connected with Bituminous Coal Codes.

## Congratulations

¶ TO GEORGY H. NYE '85, on his election as chairman of the Massachusetts Federation of Planning Boards; HAROLD L. ROBINSON '11, on his election as vice-chairman; and GORHAM DANA '91, on his reelection as Treasurer.

¶ TO ALBERT SAUVEUR '89, on becoming an Honorary Member of the American Institute of Mining and Metallurgical Engineers.

¶ TO CLARENCE M. JOYCE '03, on being named a Fellow of the American Association for the Advancement of Science.

¶ TO ARTHUR C. HARDY '18, on his election as Vice-President of the Optical Society of America.

## Highest Engineering Honors

¶ The John Fritz Gold Medal, highest of American engineering honors, was awarded in October to the late JOHN R. FREEMAN '76 as "engineer — preëminent in the fields of hydraulics and water supply, fire insurance economics, and analysis of earthquake effects." Mr. Freeman died on October 6, 1932.

## In the News

¶ GORHAM DANA '91, for his criticism of town planning boards for their "prone-ness to sit back and wait for some problem to be brought to them when their true function is to study their town con-

tinuously and make suggestions that will benefit the community without reference to personal aggrandizement."

¶ GERARD SWOPE '95, for his suggestion that the administrative functions of the NRA be taken over by organized industry itself as an industrial self-government administered through a "National Chamber of Commerce and Industry" built around the present organization of the U. S. Chamber of Commerce.

## Presented

¶ At the 62nd annual meeting of the Public Health Association in October, papers on sanitation by LANGDON PEARSE '01 and HARRISON P. EDDY, JR., '17. — At the 1933 Convention in October of the American Society for Steel Treating, the following papers by Technology men: ALBERT SAUVEUR '89, "Notes on the Aging of Metals and Alloys"; MARCUS A. GROSSMANN '11, "On Grain Size and Grain Growth"; JOHN T. NORTON '18 and Alfred Ziegler, "Sensitivity of the Gamma Ray Method of Radiography"; WALTER CRAFTS '26, J. J. Egan, and A. B. Kinzel, "Low Temperature Impact Strength of Some Normalized Low Alloy Steels." — At the meeting of the American Welding Society papers were given by: THOMAS H. SPELLER '29, "An Aircraft Manufacturer's Experience with Welding Quality Control"; ROLAND P. DAVIS '06 and G. P. Boomsliker, "Tensile Tests of Welded and Riveted Structural Members." HENRY M. HOBART '89 was chairman of the conference and meeting of the Fundamental Research Committee of the American Bureau of Welding.

¶ By Professor FREDERICK J. ADAMS of M. I. T., an address on "Housing in Relation to Planning," at the joint meeting of the Massachusetts Federation of Planning Boards and the Statewide Housing Conference of the Massachusetts Civic League.

¶ By ELMER A. HOLBROOK '04, an address delivered at the Mining and Metallurgical Session of the Summer School of Engineering Teachers, University of Wisconsin, on "Purpose and Scope of Mining and Metallurgical Engineering Education."

¶ By Mrs. ELEANOR MANNING O'CONNOR '06, member of President Roosevelt's housing commission, an address on "Architecture as a Profession for Women" at a tea of the Massachusetts Society for the University Education of Women, in October.

¶ By THOMAS C. DESMOND '09, an address at the 100th anniversary celebration of the founding of Haverford College.

¶ By ELLIOTT D. HARRINGTON '18, a paper on "Indoor Climate Control: The General Problem," at the October meeting of the New York Section of the A. I. E. E.

## Deaths

¶ GEORGE A. RICKER '86, on November 2. An account of his life will appear in January in the class notes.

¶ J. WALDO SMITH '86, on October 14. The following editorial appeared in the October 19 issue of *Engineering News-Record*: "A deep sense of personal loss will remain with many throughout the country because of the passing of J. Waldo Smith, builder of the Catskill Aqueduct. Back of this sentiment lies a story of the power of the spirit to influence engineering achievement, a dramatic story that had its beginning 30 years ago. At that time New York City's millions faced the danger of water shortage, but remembering their experience with neglect and corruption in the building of the second Croton aqueduct, they feared to undertake a new supply. The times were heavy with political pressure. An independent board was finally set up, with Smith as engineer. His task involved extraordinary technical difficulties, yet these were surpassed by the problems of organizing and conducting the work so as to avoid the numberless pitfalls that might engulf the enterprise. With great wisdom and consummate skill in human relations, he initiated and carried out the great task; and throughout its 20-year duration he kept it steadily and securely on its course, free from question, attack, or interference. Engineering judgment and intuition of highest order were essential parts of his equipment, of course, but to these he joined a great power over men — an almost magical ability to inspire loyalty and affection in all who worked for him, and at the same time to disarm and convince his opponents. Integrity, simplicity and justice, and a homely New England shrewdness combined to create this power. These qualities built the aqueduct. And these same qualities together with his ever-youthful spirit endeared him to everyone who was privileged to be his friend. The Catskill aqueduct stands as a monument to Smith, one of the greatest engineers of his time and a master of human arts."

¶ CHARLES F. M. GUILD '87, on October 31.

¶ FREDERICK P. ROYCE '90, on November 5.

¶ MARY BARLOW BURTON '96 (Mrs. Paul G.), on October 25.

¶ MARY E. MATHEWS '96, on August 1.

¶ ARTHUR S. MORE '02, on July 16.

¶ IRVILLE D. WATERMAN '02, on October 30.

¶ RICHARD L. CARY '09, on October 16.

¶ FRANK C. ROGERS '17, on September 29.

¶ FREDERICK J. RASMUSSEN '19, on August 7.

¶ FREDERICK S. BAUMER '24, on October 15.

¶ WALDO M. POWERS '29, on October 14.

# NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

### *Technology Club of Hawaii*

On the morning of September 2, at about 9:15 A.M., Professor Joseph S. Newell, of the Aeronautical Department of M. I. T., stepped from the deck of the motorship *Chichibu Maru* to the wharf at Honolulu, where he was welcomed by Captain Carl F. Greene of the Air Corps of the U. S. Army, and Carl B. Andrews, President of the Technology Club of Hawaii. The *Chichibu Maru* was scheduled to depart for Yokohama at five P.M., so Professor Newell's entertainment in Honolulu was necessarily brief. Captain Greene invited him to visit the aviation station of the Army and Navy at Luke Field, Pearl Harbor, where he was taken after a short visit with Lt.-Col. Brant at the Army Headquarters at Fort Shafter, and where he was given an opportunity to see a part of the island of Oahu from the air during a 20-minute flight.

Returning to Honolulu, Professor Newell was the guest of honor at a luncheon given by the Technology Club, at which were present the following guests: Lt.-Col. Gerald C. Brant, U. S. Army; Capt. Carl F. Greene, U. S. Army; Commander E. W. Todd, U. S. Navy; Mr. Stanley C. Kennedy, President, Inter-Island Airways, Ltd.; and Mr. John H. Kangeter, Secretary of the local chapter of the American Aeronautical Association. The following members of the Technology Club of Hawaii were also present: Professor Arthur R. Keller, William C. Furer, H. P. Field, Lt. N. W. Cokey, Lt. Dixie Kiefer, Major S. L. Scott, Lt.-Commander Robert B. Pick, Sidney T. Carr, Secretary, and Carl B. Andrews, President of the Club.

Professor Newell spoke very interestingly of the affairs of M. I. T., and of the general state of aviation in the United States. After the luncheon, accompanied by Captain Greene, Mr. Furer, and Professor Andrews, he visited the Pali, near Honolulu, the engineering department of the University of Hawaii, and Waikiki of the famous beach, reaching his vessel in good time before sailing, where he was bidden *bon voyage* by his friends who remained behind. — SIDNEY T. CARR '06, Secretary, Hawaii Electric Company, Ltd., Honolulu, T. H.

### *Technology Club of New York*

With alterations completed, the club is now prepared to cope with the exigencies of any situation. A more satisfactory arrangement of rooms has been secured by a redistribution of partition walls, with a reception desk at the entrance to the club quarters instead of as heretofore at one end of the reading and billiard room.

This new arrangement now permits some of our well-known members to call for smokes on the house (I mean, for the boys) without lifting their weary bodies from the chairs in which at the moment they may be watching Doc Duff trying to fulfill a small slam contract in spades, doubled and redoubled. (He made it!)

On October 23 the first session of the First Annual Dick Ranger Trophy Contract Bridge Tournament got off to a flying start. From all quarters of the compass, particularly North, South, East, and West, members came to compete. The leaders of the first session (the match continues over a period of five Monday nights) are as follows: North-South — C. W. Wilson, Sr., and Harry White (38 Match Points), Alfred T. Glasett and George Holderness (33 Match Points); East-West — Leland Wilson and Robert J. Marlow (38 Match Points), Dr. J. Fitzgerald and G. E. Kelly (33 Match Points). — MILTON MALE '29, Assistant Treasurer, 71 Broadway, New York, N. Y.

### *Technology Club of Shanghai*

The August meeting of the club was an occasion for a garden party at the beautiful residence of Ki Chun at 80 Seymour Road, on August 26, at four P.M. Thirty members, with their wives and children, formed a happy reunion of Tech families. Mrs. Ki Chun proved a most gracious hostess. Refreshments were generously provided and games and sports were indulged in by everyone. Some went swimming in the large open-air pool; others played tennis on the spacious courts, while still others with equestrian tastes went horseback riding. A most enjoyable time was had by everyone.

Two members, recently arrived at Shanghai, K. L. Chow '18 and Frank T. Yeh '14, were welcomed into the club. As this was a social meeting, no business transactions were conducted. The party dispersed at seven P.M.

The September meeting was held at the Hang Far Low Restaurant on September 19. The hosts for the meeting were Z. Z. Li, K. T. Lee, Joe W. Young, S. F. Liu, T. K. Kao, and Walter Kwok. There were 34 members and three guests attending.

The meeting was called to order by President Tse at 9:30. The minutes of the last meeting and some correspondence of the club were read by the Secretary. The President thanked the hosts on behalf of the club and asked the three new members (K. L. Chow '18, F. A. Parker '19, and R. S. Shih '16G) to rise and introduce themselves. Some minor business being disposed of, the President introduced the speaker of the evening, Robert J. Grant, who was formerly director of U. S. Mints and now serves as Adviser to the Chinese Government Central Mint. Mr. Grant

outlined the history of U. S. coinage law and illustrated his talk with statistics, which was very interesting. The meeting concluded with a Stein Song and M. I. T. cheers for Mr. Grant at 10:30 P.M. — M. C. CHAN '26, Secretary, P. O. Box 434, Shanghai, China.

### *M. I. T. Club of Akron*

The following meetings were held during the 1932-33 season of the club: The November meeting was Ladies' Night at the Fairlawn Country Club with dinner dancing and games; in January a general entertainment meeting was held at the Semler Tavern; in March, dinner and cards at the Fairlawn Country Club; in May, an outing at the Silver Lake Country Club, which included golf, dinner, songs, sleight of hand; in September, an outing at the estate of Mr. Darrow with ladies present. All of these meetings were thoroughly enjoyed by the members and we look forward to the 1933-34 season and yet more pleasurable gatherings. — J. J. HARTZ '29, Secretary, 1084 Jefferson Avenue, Akron, Ohio.

### *M. I. T. Club of Western Pennsylvania*

The club starts its 1933-34 season with a dinner meeting at the University Club on Tuesday evening, October 24. The speaker will be one of our own members, Dean E. A. Holbrook '04, School of Engineering and Mines, University of Pittsburgh. Dean Holbrook is Technical Adviser to the National Recovery Board in connection with the Bituminous Coal Codes. His subject will be "With the N.R.A. in Washington." The coal codes, of course, are of vital importance to the Pittsburgh District and a large attendance is expected.

The weekly luncheon meetings are being held as usual in McCreery's Dining Room at 12:30 every Friday. All M. I. T. men are cordially invited to attend. — C. M. BOARDMAN '25, Assistant Secretary, Duquesne Light Company, Pittsburgh, Pa.

### *Washington Society of the M. I. T.*

The second regular luncheon meeting of the season 1933-34 was held at the University Club at 12:45 P.M. on Friday, October 20.

The Society was fortunate in having as its speaker Mr. Albert W. Atwood, Editorial Writer and Economist, well known to readers of the *Review of Reviews* and the *Saturday Evening Post*, who spoke to the Society on "Professors in the New Deal."

In the course of his talk Mr. Atwood analyzed some of the factional squabbles which have occurred in the new adminis-



tration and digressed to the extent of treating briefly the suggestions which had been rendered from time to time by economists that the Little Cabinet might well be made a "career" body; or be made eligible, as replaced, to sit in an advisory capacity with the House of Representatives or the Committees of Congress; so that the knowledge and experience gained by its members might not be entirely lost from time to time upon the taking of office of a new administration.

The talk was forceful and prodding and elicited a regular debate of comment by R. O. Marsh '05, Dwight Clark '97, and F. P. McKibben '94, in addition to interjections by the President and Secretary of the Society.

The Society was glad to welcome as its guest Dr. Lemaitre, the famous astronomical physicist, now of the Catholic University of America.

Among those present were the following: Marshall O. Leighton '96, Larry Conant '21, Christopher W. Duffy '20, C. P. Kerr '11, Oliver G. Green '30, Harry E. Worcester, Jr., '97, F. P. McKibben, '94, Benjamin F. Thomas, Jr. '13, R. O. Marsh '05, F. S. Walker '30, C. B. Allen, Jr. '29, B. E. Sherrill '27, D. S. Stanley, Jr., H. M. Loomis '97, Edwin A. Packard '99, Frederick E. Howe, Dwight Clark '97, A. L. Sherman '06, W. C. Mehaffey '17, J. E. Nolte '98, B. A. Bowman '09, H. E. Whitaker '09, William E. Swift '95, Paul Weeks '02, H. P. Emerson '28, W. M. Corse '99, Allen Pope '07, William E. Lutz '18, A. E. Hanson '14, H. W. Tyler '84, *President*, Proctor L. Dougherty '97, *Honorary Secretary*, and the Secretary. — JOSEPH Y. HOUGHTON '26, *Secretary*, 402 Shepherd Street, Chevy Chase, Md.

## CLASS NOTES

### 1876

Charles W. Hubbard was born in Newton, Mass., February 14, 1856, and died in Weston, May 22, 1933, where he had lived since 1868.

He prepared for college at Noble's, now Noble and Greenough School, and was graduated from Harvard University in the Class of 1878. He was a special student in chemistry at Technology for one year in the Class of 1876.

He was a Life Member of the Corporation of M. I. T. from 1889 to 1918, during which period he served on several committees. He was greatly interested in the affairs of the Institute and took seriously his duties as a committee member, possibly because the instruction given at the Institute in many respects fitted men for such work as his business required.

His father, Charles Townsend Hubbard, founded the Boston Flax Mills; he also became Treasurer of the Ludlow Manufacturing Company. He conceived the idea of uniting the two enterprises. This was done in 1878 under the name of Ludlow Manufacturing Company, now the Ludlow Manufacturing Associates.

Charles W. Hubbard was connected with this organization from 1878 to 1912

and was Treasurer of the same from 1887 to 1912. From 1912 to 1929, after his retirement, he devoted himself to the invention, design, and construction of a new and ingenious form of textile machinery which he called "tube winding," by which the thread mass is wound into cylindrical metal tubes instead of the customary use of the bobbin and flyer. This method of spinning, winding, and so on results in far larger packages at considerably higher average speeds than is now possible and the elimination of most of the knots in the yarn. This invention has not yet been commercially adopted and further experimental work is now in progress. If it is finally successful, it bids fair to have a revolutionary influence on some of the textile industries.

His further interest in educational matters is shown by the fact that he was one of the incorporators of the present Noble and Greenough School, and of the Winsor School, of which he was the first Treasurer.

He was also intensely interested in the Boston Lying-in Hospital, acting as chairman of the Building Committee which built the present hospital, in which were incorporated many of his original ideas.

In 1890 he built the Riverside Recreation Grounds. Failing to operate this successfully as a coöperative public country club, he later gave the property to the Commonwealth, and, with the late Francis Blake, presented the Commonwealth with land on which is now located a large portion of the public golf links at Riverside, which are controlled by the Metropolitan District Commission.

His hobbies were tramping, canoeing, and horseback riding. In early life he covered, on foot, most of England and large areas of Europe. He had a summer place and farm on Meredith Neck, N. H., with about two-and-a-half miles of shore front, and another place on Point Lookout, Isle au Haut, Maine, from both of which he received pleasure and comfort.

Mr. Hubbard was not known by many of the Class of '76. Those who were privileged to claim acquaintance and friendship later held him in high esteem for his quiet but positive views regarding the public good, his generosity to worthy objects, and his sincere personality. — CHARLES T. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass.

### 1883

Harvey M. Mansfield and the Secretary took luncheon together at the Technology Club in New York, on October 6, where they held a minority class reunion together. Mansfield has spent his entire summer in his old home at Wakefield, Mass. He was on his way south. He has seen very little of the members of the class during the summer, and the Secretary has seen still less.

It is very hard for the Class Secretary to furnish notes for The Review unless the class members will send him material. — DAVID WESSON, *Secretary*, 111 South Mountain Avenue, Montclair, N. J.

### 1889

September 23 Mauran died at Peterboro, N. H. The following is taken from the *New York Times*: "John Lawrence Mauran of St. Louis, internationally known architect, died in a hospital at Peterboro, N. H., early today at the age of 67. Dr. Ronald M. Clark said Mauran's death was caused by peritonitis, which developed after an emergency operation, performed last Sunday. The architect was at the summer home of his family in Dublin, near here, when stricken ill. Mr. Mauran was born in Providence, R. I. He spent four years, 1885-1889, at the M. I. T., and, after a year of travel and further study in Europe, entered the office of Shepley, Rutan and Coolidge, prominent Boston architects. For this firm he helped design the Chicago Public Library and the Chicago Art Institute. He became its St. Louis representative in 1893 and later its St. Louis partner. In 1900, however, he formed Mauran, Russell and Garden, the title of the partnership becoming in 1911, Mauran, Russell and Crowell, as it has since remained. From a long list of important structures designed by this firm may be cited that of the St. Louis Union Trust Company, the Butler Brothers buildings in St. Louis and Dallas, the St. Louis Country Club and the Skin and Cancer and Children's Hospitals in St. Louis.

"The amount of non-professional labor performed by Mr. Mauran would have been unusual for an ordinary man; for one of the busiest architects, it was astonishing. Since 1917 he had been on the executive committee of the American Red Cross in St. Louis and served as its chairman, 1922-28. While the United States was in the World War, he was on several national war committees. He was chairman of the Public Buildings Commission of St. Louis, 1904; President of the St. Louis Grand Opera Committee, 1910-12; chairman of the 'Made in St. Louis' Carnival, 1915; President of the Plaza Commission since 1925; President of the New England Society of St. Louis, 1913; a member of the Republican State Committee, 1926-29; President of the board of trustees of the Church of the Messiah, 1900-20, and a member of the Corporation of the Massachusetts Institute of Technology since 1925. He had been an officer of several St. Louis clubs. He attended many congresses of architects." He had also been President of the American Institute of Architects.

September 30 Kunhardt died at his home in Melrose. The *Boston Transcript* printed the following: "Louis Henry Kunhardt, whose death occurred Saturday night at his home, 303 Franklin Street, Melrose Highlands, was born in Brooklyn, N. Y., in 1869. He was graduated from the M. I. T. with the Class of 1889. After a year on the instruction force of the Institute, he joined the engineering department of the Associated Factory Mutual Fire Insurance Companies, where he progressed rapidly. In 1906 he accepted the position of Vice-President of the Boston Manufacturers' Mutual Fire In-



1889 Continued

insurance Company, where he continued in the active work of fire prevention, a field which always aroused his enthusiasm and to which he gave his best efforts. On the retirement of Joseph P. Gray as President, in 1929, Mr. Kunhardt was elected President, which office he held at the time of his death. More recently he was also made President of the Paper Mill Mutual Insurance Company, and a director of the Fall River Manufacturers' Mutual Insurance Company. In these fields Mr. Kunhardt did his principal life work. Mr. Kunhardt, however, had a live interest in a number of other things. He took an active part in the affairs of his home community and was ready to give his time in the furthering of any cause in which he believed. For some years he gave much thought to some of the difficult traffic problems of the city of Boston and worked out in considerable detail plans for additional highways to be developed in connection with the main steam railroad systems, and he urged the adoption of some such comprehensive solution with all his strength and earnestness.

"At times he took up a few outside pieces of work involving hydraulic and power engineering and mill construction, but considered these more matters of diversion. His principal recreation was taken at his summer home on Cape Cod and in the sailing of boats on the adjoining waters. Mr. Kunhardt married Sarah E. MacDonald of Boston in 1897, and she survives him. There are four children, Ruth (Mrs. J. Henry) Colon of Hartford, Conn.; Katherine (Mrs. Victor H.) Czegka of Melrose Highlands, whose husband is sailing Saturday as a member of the Byrd Antarctic expedition; Elizabeth (Mrs. Douw F.) Beekman of Schenectady, N. Y.; and John Newton of Melrose Highlands. He was a member of the American Society of Mechanical Engineers, the National Association of Cotton Manufacturers, Boston Real Estate Exchange, the Republican Club of Massachusetts, the Exchange Club, the Engineers' Club and the New Bedford Yacht Club. He had been active for many years in the Church of New Jerusalem of Boston, from which the funeral will be held at two o'clock Tuesday afternoon."

The Portland Sunday *Telegram* and Sunday *Press-Herald* of September 3, 1933, carried the following story about Pike, accompanied by a double column and life-like crayon portrait. "A consulting electrical engineer of national reputation, Maj. Clayton Warren Pike of Philadelphia, a native of East Fryeburg, is frequently called upon to serve on important commissions and investigating bodies. He first came into national prominence some 20 years ago when, through the miracle of a political revolution in Philadelphia, Mayor Rudolph J. Blankenburg, a reform mayor, appointed him chief of the electrical bureau in Philadelphia which spent approximately two millions per year. Major Pike, an independent in politics, justified the appointment, saving the city about a million dollars in four years. At the present time

he is a consulting engineer for the Power Authority of the State of New York which is charged with the development of water power on the St. Lawrence River, where the joint plants of New York and the Province of Ontario will aggregate over 2,000,000 horse power. He has also done much work for the Public Service Commission of New Hampshire which has consisted in the examination and appraisal of electric systems and ascertaining whether the value of the properties justified the issuance of securities to the amount asked for. Since 1930 he has also made many appraisals for the State Tax Commission of New Hampshire. He has written a number of articles on electricity, the most recent being a rather exhaustive treatise on the distribution of electricity which was read before the Institute of Public Engineers and has since been published in book form. Major Pike received his preparatory education in the schools of his native town and at the old Fryeburg Academy. He graduated from M. I. T. in '89 and after serving in various capacities with manufacturing concerns, he was appointed instructor in electrical engineering at the University of Pennsylvania. He relinquished this position to resume private work, finally becoming Vice-President of the Kellar-Pike Company. With the outbreak of the World War, he resigned from the Kellar-Pike Company and offered his services to Uncle Sam. He was placed in charge of the small arms in Washington and later was made chief of the statistical section. He retired from the service with the rank of major. He is a member of a number of national and international electrical societies and organizations. He owns a beautiful place at Fryeburg where he and his family spend each summer."

In these times it is pleasant to read of one of the '89 men retiring to a delightful place to really enjoy life. *Telephone Topics* of July, 1933, had the following about Emery, also accompanied by a handsome portrait and a picture of Emery's new country place which looks exceedingly attractive. "After 44 years of service in the telephone business, Howard B. Emery retired on July 1 to his newly-purchased farm in Franklin, N. H. The farm is a find that required months of searching. In fact, he looked at 72 different places before he decided that this was the place. Located in the foothills of the White Mountains, it boasts a six-room house and five acres of land on which Howard will do some light farming and heavy loafing. To him and Mrs. Emery the place represents hearts' desire. Howard Emery entered the business in June, 1889, as a rodman, and throughout the early part of his telephone career was concerned with engineering matters in the Metropolitan Plant Department. On February 3, 1913, he was appointed superintendent of rights of way for the Metropolitan Division, reporting to I. O. Wright. He held this position for many years, and lately had charge of relations with the American Telephone and Telegraph Company in the Metropolitan Plant Engi-

neers. Howard Emery was called the 'daddy' of the Pioneers in New England, for he obtained charters for three of the chapters and served as the second President, for two terms, of Thomas Sherwin Chapter." — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston, Mass.

## 1891

Howard Forbes has rented his house in Cambridge and they spent some time at East Falmouth this summer. He and Mrs. Forbes are planning a trip abroad this winter. — Arthur Alley has returned to his "farm" in Southern California after spending several months in and around Boston.

Jim Swan was abroad last summer and saw quite a little of Scotland and Scotch life and hospitality. His daughter has gone to Los Angeles for an indefinite stay. She is well known in moving picture circles, selecting books or plays, and choosing persons for certain parts. She is with the Fox Film organization.

The Tech Club of Rhode Island, combining with Fall River and New Bedford, held a dinner at the Agawam Club, East Providence, in October, with President Compton, Dr. Rowe, and Professor Locke as guests and speakers. Over a hundred were present and '91 was represented by Ed Smith, Billy Dart, and the Secretary.

The Secretary and Mrs. Fiske went to Cohasset in October and had a picnic luncheon with Barney Capen. Jim Swan came over from New York and the four of us had a delightful time, reminiscing, and reading letters from many classmates. We had hoped to have others with us but various plans interfered.

Barney received three letters from George Hooper during August and September. As a staunch Hoover supporter, he was much disturbed at changing the name of the Hoover Dam, and some of us, at least, feel the same way, without knowing all that is back of it. He spent the summer at Santa Barbara and says there was quite a lot of fog "but, like everything else in California, this was unusual." Charlie Garrison also speaks of the fog along the coast this summer.

At last we have heard from Charlie Ricker. Those of us who have had the pleasure of accepting his hospitality in Havana, and his other friends in '91 as well, have wondered whether he was still in Havana. "Last August my wife and I went north for a vacation, the first in three years, and I was feeling rather seedy. We went direct to Cleveland to meet my son (M. I. T. '28) who lives there and we did not go near enough to Boston for a visit there. Our return was put off once because of conditions in Cuba and we got back September 29, about half an hour after the end of a general strike and a communist riot with a lot of street fighting. The Monday following was the Hotel Nacional fight with a good deal of violence in other parts of the city and on Wednesday, we had a cyclone that tore things up plenty in Havana and vicinity but gave us a day of comparative quiet otherwise."

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"We live about a mile from the National, fortunately not in the line of fire although we had a few shots overhead, so we stayed in the house all day and kept our street door barricaded. Happily it did not last after dark, otherwise the results would have been different because police protection was hardly available in such conditions. Since then things have been fairly quiet in Havana although hardly anyone goes out after dark unless it is necessary.

"I cannot write you about this situation because I have lived here too long and know too many people. But conditions are alarming and I often wonder how long I shall stay and how I shall leave. However, things may clear up some day, and I shall try to do better about the letters. With kindest regards to you and any of the boys you may see."

A letter from Charlie Garrison in October tells of another of his auto trips in Southern California. They went up in the hills to a place called Idlewild and Mrs. Garrison had an unpleasant experience from SO<sub>2</sub> leakage from the refrigerator, which made her ill, but plenty of fresh air made her all right again. "Before going on our Estes Park trip we called on the Shattucks. Forrest was too ill for us to see him — and when I returned I wrote to Mrs. Shattuck and have just had a reply that he has been very sick but that he is much better and would like to have us come and see him. We shall do so as soon as an opportunity affords. We had a heavy earthquake shock at 1:10 A.M. this morning, but no serious damage resulted. It was of greater intensity in Los Angeles and Pasadena. Bob has been made chairman of a committee to determine the quota of oil production at Huntington Beach and for full measure the State is bringing suit against the wells and operators (including Bob) for draining the oil from the reserve supply in the ocean."

John Putnam wrote Barney in October: "We are all pretty well. My wife is up on the Cape and I want to go later but can make no definite plans. Whether I could see you or not it is impossible to tell, for Cohasset is sort of out of the way for me and I hate driving in Boston suburbs. Priscilla is with my sister and plans to marry in December, I think. Jeanne is well and presented me with a grandson last March. He is a beautiful boy and a great comfort to his grandpa. Faith went to the Fair in Chicago in July, spent two weeks there and about six weeks in Elmira visiting old friends of ours. Not much doing in the Kitchen so we felt she ought to have the trip as she really has never been away very much. She is now home and sends her love to you.

"I was cut up over the death of Elisha Lee. He wrote me only about a week before he was taken away about transportation for Faith to the Fair and his death was a shock. I had hoped he would live to get Atterbury's job. I suspect the sudden death of his wife was a terrible blow to him. I don't know whether I wrote you, but I spent three weeks in June with Thornton Burgess at his

summer home in Hampden, Mass., a lovely country. I painted several pictures with fair success and we two old fellers had a great time as Mrs. B. was in Europe and Mrs. P. in West Haven." — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R. I. BARNARD CAPEN, *Assistant Secretary*, The Early Convalescent Home, Cohasset, Mass.

## 1895

We learn that John H. Gregory has resigned as a member of the Engineer's Advisory Board of the Reconstruction Finance Corporation. We also note from the Sunday *Star* of Washington, D. C., issued September 17, that John H. Gregory has been appointed a member of the Board of Sanitary Engineers to investigate and report on the disposal of sewage of the District of Columbia.

We quote from the *Star* as follows: "In a definite move to lessen the pollution of the Potomac River and its tributaries, the Commissioners of the District appointed a special board of sanitary engineers to plan development of a modern sewage system.

"The members of the board are Harrison P. Eddy of Boston, John H. Gregory of Baltimore, and Samuel A. Greeley of Chicago. Mr. Eddy is a member of the firm of Metcalf and Eddy, consulting engineers of Boston, and active in this engineering practice for more than 40 years. Mr. Gregory is professor of civil and sanitary engineering of Johns Hopkins University, Baltimore, specializing in water and sewage work since 1895. He has served on similar commissions in New York, Baltimore, Chicago, Detroit, and Columbus, Ohio. Mr. Greeley (Technology '06) has been active in the practice of hydraulic and sanitary engineering for 30 years. He has been retained in connection with river pollution problems by Minneapolis and St. Paul, Kansas City, Peoria and Perkin, Portsmouth on the Ohio, Dallas and Fort Worth, and by the State of New Jersey on the Delaware River diversion cases.

"Elimination of pollution from the Potomac, which has been shown in Government reports to be killing the fish in the river as well as making swimming a health hazard, has been the object of a civic campaign for a number of years. The board is directed to consider various practical methods for treating District sewage and prepare a general plan for treatment, having in view the experience of other cities and the situation in Washington. The treatment should be of such a nature as to respond to the test of economy as well as to the demand that a high standard of purity be maintained in the Potomac River contiguous to the National Capitol, as an example to the Nation."

The members of the class will remember that Ben Hodge passed away last March in Redlands, Calif. It is interesting to know that Mrs. Hodge, together with her daughter and her husband, Hugh Hill, are conducting for paying guests "Greenhill Ranch," situated on a hill

in a beautiful orange grove, overlooking the famous San Bernardino valley. For any who may be going to California this winter, this offers an unusual opportunity of sunshine, rest, and recreation. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

## 1896

The Secretary learned recently from Professor Fred Morris of the Geological Department at Technology that Grabau made the journey all the way from China to attend the Geological Conference in Washington last July, and he was given a most enthusiastic welcome by fellow geologists. Physically he is in poor shape, as his arthritic condition necessitates the use of crutches, and it is almost a major operation to get him in and out of an automobile, but mentally he is as keen as ever and the world is beginning to appreciate his splendid work on the geology of China. He sailed on September 6 to return to his teaching duties in Peiping.

Billy Anderson spent the summer as usual at Biddeford Pool, Maine, and on his return to Cincinnati early in October he and Mrs. Anderson stopped over in Boston for a week seeing old friends. Incidentally, Billy got in some good golf games with Rockwell and others while here.

Another honor has come indirectly to the Class by the appointment of Jacobs (Pardon us, Professor E. C. Jacobs!) to be State Geologist of Vermont, which was confirmed on September 23. — Russell Porter, who is busy at the University of Southern California in Pasadena installing the new telescope, found time to make his annual trip back to Maine this last summer, but it was so hurried that he and Mrs. Porter were seen by very few of their friends in the East.

A new interpretation of NRA has been supplied by Lucius Tyler in the form of "nearly ruined already."

Sam Hunt writes from Manchester, N. H., that last fall when the banking situation became acute, and the pressure of the duties of handling his father's estate became consequently greater, he had to sever his connection with the Public Service Company of New Hampshire. He seems to be in considerable demand for civic duties, such as being President of the Kiwanis Club, a member of the NRA Committee, and a public speaker always on tap. Last summer just for a little mental training, he attended the Vermont Summer School of French at Middlebury, and got a real kick out of it, passing the final examinations successfully, and carrying on at the same time an extra course in Italian. He reports that it was some job to keep these two languages separate. One of his jobs at present is research into the clinical methods of blood testing for cancer diagnosis. Results so far have been most promising and he believes that anyone who has any question in his own mind whether or not he



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has any cancer in his system can have that question definitely settled by a blood test. Such a test should be of tremendous advantage, because it would relieve the minds of many people who labor under the delusion that they have cancer, and at the same time it would allow physicians to catch the disease in its earlier stages and thus combat it more effectively.

Billy Clifford finds refuge on his farm in Virginia whenever he tires of traveling, or whenever he yearns for peace and quiet. He says he keeps himself young by devoting himself to his boys, one of whom is now in the senior class at the U. S. Naval Academy and the other is a fifth year man at the Yale School of Fine Arts, specializing in painting. He and Mrs. Clifford do a bit of traveling every year, although he feels that this year, on account of the uncertainty of the currency situation, they will probably stay on the farm all winter.

Charlie Tucker had a good apple crop this year at his farm in North Andover. His daughter, Helen, took her Ph.D. degree at Technology last June, and that makes a score of two doctors', two masters', and two bachelors' degrees which the Tucker children have taken from Technology.

LeBaron Russell, after 25 years with the banking house of E. H. Rollins and Sons, has now gone with the brokerage firm of H. Hentz and Company in their Boston office, 75 Federal Street.

Perl Underhill has arrived in the grandfather class and is quite set up over his granddaughter, five months old in October, who according to his claims is quite some kid. He is busy selling Ford cars in Watertown and is finding business much improved.

George Hewins is another man who is enjoying a grandchild, in the form of a grandson by the name of George Hewins Sanderson, who is reported to be a husky and as healthy as they come. George is apparently doing the typical job of a grandfather of spoiling him. Incidentally, he is doing quite a bit of traveling and getting plenty of fresh air these days, and also a lot of joy out of living in connection with plugging along on the job.

Irv Merrell is back in St. Petersburg, Fla., for the winter. Although now in fairly good shape, he has had a bad year, which started with thrombosis in the lung about a year ago. This was followed by an abscess, and finally pneumonia. As if this was not enough, he wound up with six weeks of shingles. However, he was able to discharge his nurse the 15th of August last, and is in hope that his present satisfactory status may continue for a while after having gone through such a siege.

Walter Pennell had the misfortune to lose his wife last February, and he and his son are now living together in Webster Groves, Mo. His daughter is married to Dr. Melton on the staff of Yale University. In addition to his telephone duties, Walter is a member of the Board of Visitors to Washington University in St. Louis. Following his usual custom,

he returned to his old home town of Exeter, N. H., last summer, although he actually spent the time at Rye Beach. With his characteristic foresight, he has purchased a house in Exeter, where he will spend his summers in the future, and where he looks forward to living when he retires.

Joe Stickney is still operating an insurance office in Indianapolis, covering everything except life insurance, in which he will take no chances. Much to his regret, he was unable to send any progeny to Technology, because his only child is a daughter, and attended Miss Moxley's School in Rome, Italy, and the Katherine Gibbs School in New York. Joe's main activity has been the Indianapolis Athletic Club, where he was Chairman of the House Committee for two years, and did such a good job that he is now on his second term of President. He has found time, however, to visit the Century of Progress Exposition in Chicago three times, and has done his duty by registering in the Technology exhibit. He has recommended strongly that everyone who could get there should not fail to do so.

Professor L. P. Dickinson, University of Vermont, after being incapacitated for a year and a half by reason of two heart attacks, now seems to be in fairly good shape again, and is back on the job, so that he is looking forward to being present at the celebration of our fortieth anniversary.

Gene Hultman, as Police Commissioner of the City of Boston, is also making his plans to get a day off, through special dispensation of the Governor of the Commonwealth, at the time of our Fortieth Reunion.

Dan Bates says he is busy, and anyone who knows Dan will believe it. He has been working through the depression like the rest of humanity, and will breathe a sigh of relief when NRA, or something else, pulls us out of it. He is in the Packard Building in Philadelphia, and would like very much to have a call from classmates who may be coming his way.

October 13, 1933, W. I. McNeill, Secretary of the Chicago Club, wrote that Robert D. Flood had called upon him recently and reported that James Clayton Russell had been dead two or three years. He further stated that Russell was commissioned as a Captain during the War and assigned to the Intelligence Department, although he remained in this country during the entire period of the War. He was very much interested in the work of the American Legion and a Legion Post in Chicago is named after him.

H. J. Hilliard sees life going serenely by from his vantage point in the Home for Aged Men on West Springfield Street in Boston. In his opinion the home is a very nice, comfortable place of residence, allowing one an opportunity to enjoy his bent of reading, or other lines. Hilliard is apparently very well and happy there.

Jim Driscoll sent in a clipping from the Washington Sunday Post of October 15, telling of the ruling of Comptroller General McCarl to the effect that two recently promoted Admirals cannot receive the

pay of their new rank because of the economy act. This is of interest because one of these Admirals is R. E. Bakenhus. However, perhaps he should consider himself lucky that he does not get a reduction of pay with his advance in rank.

Dr. Winthrop H. Chenery of Washington University in St. Louis will have the sympathy of classmates in the death of his mother in Belmont at the advanced age of 86. She had been a prominent figure in Belmont throughout her lifetime.

Last month we left the Fullers approaching Bahia, Brazil. We now go on: "The morning of February 1 found our ship entering the port of Bahia, on the Bay of All Saints, a few degrees south of the equator in Brazil. The city, founded only 18 years after the discovery of America by Columbus, and now the second cocoa port of the world with a population of nearly 400,000, is divided into a lower town along the water and an upper town, reached by ramps, winding roads, inclined railways, and even vertical elevators, on a plateau 250 feet above the sea. Everywhere the square towers of old churches, almost one for every saint, giving the name to the bay, rise above the other buildings. The interior of the cathedral is one solid mass of gold-covered carvings.

"Good asphalt thoroughfares, thronged with American automobiles and bordered by substantial buildings, are found in the business section, but old, narrow and rough block-paved streets prevail in the outskirts. The sidewalks are mosaics of tiny stones laid in the scrolls and geometric designs characteristic of Portugal and its former colonies. Many of the residences have scenic paintings covering their smooth stucco sides. In the crowded markets live monkeys. Snake and lizard skins were among the more unusual things offered for sale.

"Two days at sea, than came incomparable Rio de Janeiro, the most beautiful port in the world, backed by big bare rounded domes or peaks of granite and high mountains clothed with tropical forests, bamboo, tree ferns and brilliantly flowering trees. Tunnels through separating hills connect different parts of the city, while an aerial cable takes visitors to the top of Sugar Loaf, 1,000 feet high, at the entrance of the harbor, and a cog-railway to the summit of the pinnacle of Corcovado, 2,300 feet above the sea. A statue of Christ, with arms outstretched in the form of a cross, caps the crest and is visible for miles around.

"Magnificent avenues, backed by parks, stretch for nearly five miles along the curving waterfront. The blaze of the long line of lights is a magnificent sight at night. Many palatial public buildings, largely of Italian types of architecture, are seen, while modern skyscrapers are represented by a 21-story newspaper building facing the quay at which we docked. The city has a million and a half inhabitants.

"February is midsummer here and the heat terrific with the thermometer well over 100° in the streets. One of our pas-



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sengers succumbed after his return to the ship and was buried at sea, with services read by the captain the following morning." — CHARLES E. LOCKE, *Secretary*, Room 8-109, M. I. T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

## 1897

The following account of the death of our classmate, Farley Osgood, appeared in the October 14 issue of *Electrical World*: "Farley Osgood, consulting engineer and for many years a prominent figure in the electric light and power industry, died on October 6 after several months' illness. He was 59 years of age.

"A native of Boston, Mass., and a graduate of the M. I. T., Mr. Osgood started his career in the public utility industry in 1897 as a telephone engineer, with the American Telephone and Telegraph Company, then known as the American Bell Telephone Company. After a period of five years, in the course of which he had risen to the extent of becoming a territorial manager in New Jersey, he became engaged in high tension work and finished the construction of the New Milford Power Company's plant on the Housatonic River in Connecticut, developing its transmission system, organizing the operating force, and acting as its chief engineer and general manager for some four years.

"From New England Mr. Osgood returned to New Jersey to become general superintendent of distribution for the Public Service Electric Company at Newark. It was not long before his capability won recognition and he was soon directing the production department and in addition the engineering department. In the spring of 1917 he was appointed Vice-President and General Manager of the company, in this capacity being responsible for the operation and engineering of one of the largest light and power utilities in the country. He resigned from this executive position in 1924 and later established consulting engineering offices in New York to engage in the design, construction, operation, and interconnection of public utilities.

"In the course of his career Mr. Osgood gave much of his time and energy to certain phases of association work. From 1924-1925 he served as President of the American Institute of Electrical Engineers, having previously been a member of many of that association's committees, including the standards, Edison Medal, overhead and underground line construction, executive, finance, and several other committees. As a representative of the A. I. E. E., he had much to do with the formation of the National Electrical Code so well known as the standard specification for interior wiring. In the National Electric Light Association, Mr. Osgood was also very active, having been a member of the executive committee of the Technical Section and its vice-chairman, as well as the recipient of numerous committee appointments in that society." — JOHN A. COLLINS, *Secretary*, 20 Quincy Street, Lawrence, Mass.

## 1901

In the *Washington Post* of August 31 of the current year appeared a most attractive picture of our friend and classmate, Allen B. McDaniel, as a part of an article, the headline of which was "Beer License Siege Occurs at Arlington." I confess for a moment that my heart sank. I saw Allen standing in his saloon repelling a horde of thirsty advocates of the Repeal of the 18th Amendment with a well-directed barrage of swiftly flung beer bottles — and then the illusion passed. Not Allen but another stalwart is embroiled in the beer situation. Allen has been appointed sanitary engineer for the county; his job, to award contracts for water system extensions. After all, 3.2 doesn't modify the original vehicle to any appreciable degree but emotionally it falls in an entirely different category. I am still puzzled, however, why Allen's picture rather than the recalcitrant county commissioner of revenue graced the article. Probably Allen is better looking.

Another gleaning from the newspaper, though of an earlier date, announces the marriage of our classmate Matthew Chauncey Brush to Miss Elizabeth Hunger. Needless to say, in the several sympathetic write-ups of this important event which have come my way, Mat has not escaped the usual paragraph dealing with his collection of elephants. I fancy all syndicated papers keep this item set up and run it routinely in the many press notices which Mat's numerous activities engender. The *New York Herald Tribune* interpolates an interesting variation of the *leit-motif* and states that Mat is a constant attendant at the circus and, I quote, "provides large meals of bread and carrots for his favorite beasts." It cannot be that he is ignorant of the impelling charm of the succulent peanut to his favorite pachyderm, and so I gather this is no more than one more evidence of incomplete reporting. The hay and carrots make me think of the late lamented Horace Fletcher, the apostle of mastication. Horace once invited a friend to Christmas dinner at the Waldorf-Astoria in the days when that hostelry housed Peacock Alley as the central point in the social solar system. Horace offered his friend, as the sole comestible on this gala occasion, a plate of bean soup which was presumably to be thoroughly masticated by them both. What the friend said is not recorded but a few days in the hospital served to restore Horace to that vigorous health of which he — alone — was never tired of speaking. I have wandered far from Mat, but the elephants intrigue me. May I, as spokesman of the Class, in my official capacity extend to the happy pair the best wishes of 1901. Knowing something of the beautiful specimens in Mat's collection, I for one am willing to furnish a habitation for homeless elephants if their size permits their introduction into my modest hall bedroom.

Charlie Locke, the Secretary of all of us as alumni, from the depths of his omniscience at which I never cease to marvel, advises me that Denny Haley of

Aroa, Venezuela, was in New York in the middle of April. Denny is an agile bird, for when last I heard from him he was sitting on a copper mine somewhere in Montana — I believe they have copper mines there, anyhow we sell stock here in Boston — and paternally watching the successful progress of two daughters through the academic groves of Bryn Mawr.

Bill Sweetser writes in to me that he caught a brook trout this spring which weighed 18 oz. and measured 14¾ in. and that this was but one of a dozen that filled his creel on a single occasion. I wonder if it has ever occurred to Bill that I am partial to brook trout and that my nearest approach to a trout stream for many years past has been the Pond in Boston's Public Garden. We don't catch trout there, but any well-informed ichthyologist can give you first-hand of the denizens of its slimy depths. After the first of January I presume it will once more become a repository for empty pints and quarts. That's a contingency that Bill doesn't have to worry about. In his part of the world they have been conducting a noble experiment for a great many decades with a success that warrants admiration. If Bill's eye chances to fall on this — a sloppy phrase that, and one scarce sanctioned by the frequent usage of centuries — when next he pulls out another pound and a halfer, he will recall that I like trout and that both the parcel post and the express company that changes its name so frequently at the behest of a paternal government, are both competent to bear me any little tribute of regard and attention which his boundless generosity might suggest. Having hinted, I hope effectively, for fish and flesh, there remains only to present to any gunner a pathetic appeal for fowl — the duck season is approaching — and I myself with my hereditary roots emerging from the soil of Gloucester, Mass., from which point Arthur Davis of the Class of 1901 dispenses all of the products of the briny deep, I myself, I repeat, will provide the good red herring. This is no vain or empty boast and I challenge any member of the Class to prove it with his teeth.

Returning for the moment to the short and simple flannels of the affluent — I have already dealt with the poor *in propria persona* — I turn to that good friend and comrade, A. F. Sulzer of Rochester, N. Y., and the Eastman Kodak Company. Al, like most of the Class, has been struggling with Codes and the NRA. In spite of the governmental onslaughts, Al maintains his cheery optimism and incidentally encourages me to hope that we stay in the black.

I should like to make one more appeal to all of you who read this to help me, if you can, with the addresses of the missing. I don't ask you for information about LeBosquet, as I am a reasonable fellow. As my eye scans the list, it picks up such names as Jack Bronson who, if he is alive, must certainly be known over a fairly wide radius; Rusty Glover, a convivially and socially minded youth who must have carried those admirable quali-

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ties into adult years; and Bill Sturtevant, who though he had no connection with our local industry of that name and had a personality antithetical to its implication, must be known for his genial qualities and companionship. Look over the list and see if you can't land an address or two for me as a Christmas present. In these hard times it is the only one I am likely to get and so would be doubly appreciated. I await in hope. — ALLAN WINTER ROWE, *Secretary*, 4 Newbury Street, Boston, Mass.

## 1902

Walter Havens Farmer, whose death was noted in the last number of *The Review*, was born at Hartford, Conn., on January 15, 1879. He graduated from the Hartford High School in 1898 and entered Technology that fall as a member of the Class of 1902, taking Course I. In the Institute he was active on the publications, serving on the staff of *The Tech* throughout his four years and rising to be Editor-in-Chief. He was statistician on the '02 *Technique* Board and historian for Class Day.

Immediately after graduation, Farmer went to work for the Boston and Maine Railroad, in the Maintenance of the Way Department with headquarters at Nashua, N. H. In the ten years that he remained with the B. & M., he rose to be division superintendent in his department. In the fall of 1912 he became associated with E. I. du Pont de Nemours Powder Company as resident engineer for the construction of extensive additions to their plant at Barksdale, Wis. On the completion of this work in 1914, Farmer entered the employ of the Champlain Silk Mills of Whitehall, N. Y., but in the fall of 1915 he returned to the du Pont interests and remained with them continuously until his death.

For a year and a half Farmer was assistant superintendent of the du Pont mills at Wayne, N. J., and then for two years was superintendent of the Brandywine Mills, near Wilmington, Del. From 1919 to 1921, he was in the Wilmington office, first as assistant manager and then as manager of the Works Planning Section of the Service Department. Then for two years he held a similar position in the Paint Department. Following that, he became technical investigator in the Development Department.

From 1925 to 1928, Farmer was in Buffalo, with the du Pont Fibersilk Company and for the past five years had been director of the Technical Department of the Development Division of the du Pont Rayon and the du Pont Cellophane Companies at their New York headquarters.

Farmer was married on October 1, 1906, to Ruth Paul Capen, daughter of President Capen of Tufts College. A son, Elmer Capen, was born to them in 1908 and later a daughter, Mary E. Mrs. Farmer died in 1921. In 1924 Farmer married Mrs. Elsie Hoopes Nesbit of Wilmington, who survives him. For the past five years the Farmer home has been in Rye, N. Y. — FREDERICK H. HUNTER,

*Secretary*, Box 11, West Roxbury, Mass. BURTON G. PHILBRICK, *Assistant Secretary*, 246 Stuart Street, Boston, Mass.

## 1903

Since the last number of *The Review*, we have received further information from M. Y. Ferris concerning the death of F. W. Davis. It seems that Davis was returning from church in an automobile on July 9, being driven by his oldest son, when he collapsed and died immediately from a heart attack. Ferris had visited him within a week and had no suspicion but that he was in perfect health. Davis had been President of the Pilgrim Laundry Company for a number of years, succeeding his father, H. M. Davis. Previous to that, he worked for the Pennsylvania Lines west of Pittsburgh for about a year immediately upon graduating. He is survived by his wife, Esther Seville Davis, two sons, and a daughter. Ferris is chairman of the Lake Champlain Bridge Commission, consisting of representatives from both New York and Vermont.

One of the coveted honors of the scientific world has been conferred upon C. M. Joyce. He has been named a Fellow of the American Association for the Advancement of Science. The class congratulates him on this honor.

A very interesting letter has been received from A. F. Bennett, who is located in Jujuy, Argentina. He writes as follows: "As to what I have been doing for the last 30 years, as I look back on this I can say that they have been most interesting, and that examinations have taken me as far north as Alaska, and as far south as Chile. The first seven years after leaving Tech were spent in operating in different mines in Mexico. I then made examinations independently for a number of years. In 1920 some friends and I took over an asbestos mine in Canada, and worked it until 1925 when we sold the property, having equipped it meanwhile with steam shovel and having worked it successfully. This period during our operations was one of dropping prices, which is a wonderful condition to teach economy. Since 1925 I have been in South America for the St. Joseph Lead Company, at present in charge of their work here. As to 'family acquisitions,' which I had almost forgotten, it is very simple in my case as I am still a bachelor."

He speaks also of having met Copeland in Chile. We wrote to Copeland about a year ago in the hope of drawing out some interesting information for the class. Thus far he has probably been too busy to let us know what he has been doing. — FREDERICK A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 89 Broad Street, Boston, Mass.

## 1905

Maurice (Lanky) Weaver, VI, writes: "I am right where I have been since 1908, the year I entered the Patent Office. During this time I have worked in many divisions, examined in many arts, taken many promotion examinations, flunked some, passed most, and since 1926 I have

been chief of Division 37 to which is assigned Class 200, Circuit Makers and Breakers, which relates to every conceivable type of switch and circuit breaker.

"Since leaving Tech I have studied law, on my own account without attending law school, passed the bar examination, and have been admitted to the District of Columbia Bar. So you see that I am, in legal contemplation, a self-made lawyer. But I am going to confide one of my deepest secrets to you: I believe I have made a poor job of it.

"During this time I have been on duty for my Uncle Sam, I have done my duty by him. I have a pretty daughter, Mary, of 22 and a husky, likewise good-looking, son, Robert, of 18. It might not be improper for me to remark that the daughter is smart just as her father *used to be* and has inherited her fine disposition from him. Frankness, however, compels me to state that the good looks above mentioned are directly traceable to the finest little woman in all the world — their mother.

"Mary graduated from George Washington University last June with an A.B. She is now taking a business course and her ambition is to become a business woman. Robert will go to college next year. He wants to study political science and economics and has the ambition to discover the means whereby depressions may be forever banished and prosperity made perpetual.

"As for me, I have not become such a dodo that I have lost all interest in the great out-of-doors. I do not care much for golf and ping pong but I do like and take a couple of fishing trips a year and usually a big-game hunting trip to Maine or elsewhere in the fall. I have numerous guns of every caliber, power, and description which might not improperly be considered as proof that I am just a little 'nutty.' And oh! how I like to burn up the road with my Lincoln touring car!"

In the July notes we cheered for the ten classmates listed in "Who's Who in America" for 1932-33. Later it developed that Doc Lewis, X, and Norman Lombard, II, whose names appeared in the edition of 1930-31, had been dropped. Why? And now it is reported that Doc has emerged from his dark little out-of-the-way private laboratory and again is Head of Chemical Engineering (X). That ought to restore him to Who's Who. No word from Norman, but he who fought so long and so hard for the stable dollar must at least be cheered by the monetary news from Washington.

George Jones, II, Adolph Ortseifen, XIII, and Frank Payne, XIII, did their best to organize that long-planned '05 Century of Progress Reunion. This committee, with the help of a class list, sent out a circular letter about the first of August and wrote personal letters to many friends. The result, for some reason or other, was exactly 0. Clarence Gage, who had gone to the Fair from Evansville, did drop in on George in October but the Reunion was just not. That's too bad after all the work, for which we thank the three, for the class.



1905 Continued

Harry Atwood, II, who was in Raleigh, N. C., in 1920, nowhere in 1925, and Monson, Mass., in 1930 (manufacturing airplane parts), has been chased through Leominster, Mass. (where he didn't reveal himself to Elmer Wiggins, V) to Milford, N. H. He is connected with the French and Heald Company.

In a clipping from the *Transcript*, kindly furnished by Andy Fisher, X (Isn't it funny how few classmates send us such things?), Elmer Wiggins, V, whole family is shown in flying togs before a plane at Elmer's Hillsgrove, R. I., airplane base. Everybody flies but father, he flies 'round all day.

In June, Ted Steel, VI, wrote from Washington: "I came down here almost a year ago to make some rate studies for Potomac Electric Power Company (of the North American Company group) and am now organizing a research department of which I have been put in charge. Washington is an interesting place to be these days and is a delightful place to live, except during the humid hot spells in the summer. — When you see any of the old crowd, please give them my best and tell them I would rejoice in word from them, poor correspondent as I am myself. I am reaching an age when the friends of 30 years ago mean most; even though I haven't seen or heard from them often I feel as if I knew them as ever and hope they feel the same."

Your Secretary's youngsters were prowling around the cottage in New Hampshire which his family has occupied several summers. From somewhere they produced a number of pieces of sheet music with the remark that they must be antiques. They were, and the titles should bring tears to the eyes of every one who reads. Ready? "The Tale of a Kangaroo" from *The Burgomaster* (Is Joe Cauthorne in the audience?), "When He's Not Near" from *Peggy from Paris* (Where is Helen Hale?), "A Lemon in the Garden of Love" from *The Spring Chicken* (Has anybody heard from Richard Carle?). Try those on your memory. We'll have the music on hand at the next reunion if someone will produce the three principals.

On June 21, Miss Bernine V. Brown, Dean of Radcliffe College, became the bride of Leonard W. Cronkhite, IV, Boston industrial chemist and prominently identified with civic activities. Dean Brown's age was given as 41, and Cronkhite's as 51. He has been married twice previously and has three children. Dean Brown said she would not sever her connection with Radcliffe, but would return to her duties as Dean at the conclusion of her sabbatical year in September, 1934.

Cronkhite was born in Burma, India, the son of American missionary parents. He attended Tech and Brown and was a Rhodes scholar at Oxford. He is a former President of the Rhodes Scholar Alumni Association, is President of the Society for the Elimination of the Economic Causes of War, and active in other civic organizations. Miss Brown was born in Calais, Maine, and has been dean of Radcliffe for 10 years.

From Professor Locke: "Completion of the 12-year geologic project by Dr. Charles H. Clapp, III, President of the University of Montana, is marked by the appearance of the printed bulletin entitled Memoir No. 4, 'The Geology of a Portion of the Rocky Mountains of Northwestern Montana.' This work includes a sketch of previous geologic work in the district. Its most salient feature is the story of the shift of the great continental divide from its original location east of a near westerly line through Helena. It includes a description of the six great mountain ranges of Western Montana, of the ancient lakes that covered most of the territory, a map of the region studied, and other items of interest. This contribution is especially notable by reason of the fact that it has been entirely a labor of love on the part of its distinguished author."

According to a report in the *Boston Traveler* of September 8, Carlton E. Atwood, VI, disappeared from Revere Beach on August 16 and no word had been heard from him. Mrs. Atwood reported to the Police that her husband had been severely sunburned and had complained of pains in his head. The 1930 Register of Former Students listed him as Electrical Engineer, Weber Electric Company, Schenectady, N. Y. — ROSWELL DAVIS, Secretary, Wes Station, Middletown, Conn. SIDNEY T. STRICKLAND, Assistant Secretary, 20 Newbury Street, Boston, Mass.

## 1907

A tragic event in the life of one of our classmates occurred in mid-September when Lyman Wiggin, 23-year-old son of Mr. and Mrs. Lyman Wiggin, accidentally shot himself while cleaning a revolver, the bullet causing instant death. Lyman was graduated from Phillips Andover Academy and Chauncy Hall School in Boston. The Secretary wrote a note of sympathy to Bert and received the following reply:

"It was kind and thoughtful of you to write us a note of sympathy. Lyman's death is a terrible blow to us. We try to believe that it is God's will and must all be for the best. He had just gone to work for the Montana Power Company and was awfully happy to have a job. His work was out in the open, on one of the main gas lines, and he was much interested in it. At dinner that night he had been telling us of his plans to work for a year, save his money, and start on a medical course next year. He had become much interested in medicine the past few months.

"Our daughter, Elizabeth, is a junior at Wellesley this year. She is majoring in English and taking a course in journalism. She loves it at Wellesley and also loves New England. Albert, my other son, is ten and goes to school here in the Falls. — Mrs. Wiggin joins me in sending you kind regards." Bert is general manager of the Great Falls, Mont., works of the Anaconda Copper Mining Company.

Carl Trauerman has been elected a vice-president of the Northwest Executive

Engineers of Seattle. The Butte (Mont.) *Standard* of September 26 stated that Carl was to attend the meeting of the gold producers of the United States and its possessions, called by the Mining Association of California on October 24.

If any of you readers think that Carl has an inside influence that brings his name so frequently to these notes, be assured that such is not the case. The reason simply is that he is a most coöperative correspondent with the Secretary. Would that more '07 men took the few minutes necessary to send in news about themselves and classmates!

Harold Wonson, who holds a responsible executive position with the Commonwealth Shoe and Leather Company of Whitman, Mass., has a 15-year-old son who had just entered Tabor Academy at Marion, Mass. Harold says he is six feet, one inch tall, weighs 162 pounds, and is being developed into a full-back. Harold's oldest daughter, Marcia, is a sophomore at Wheaton College, Norton, Mass.

The Secretary has returned to life insurance work after six months' absence from this type of business activity, as the result of the suggestion of a representative of the Home Life Insurance Company of New York that he do so. His office is Room 729, 1 Federal Street, Boston. His oldest son, Bartlett, was married on October 22, 1933, to Miss Helena Tuthill of Waltham, Mass. — BRYANT NICHOLS, Secretary, 12 Newland Street, Auburndale, Mass. HAROLD S. WONSON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1909

In response to the suggestion in the October issue that it would be interesting to know where our boys and girls are attending school or college, the following letters have been received by the Secretary.

Ken May who is associated with the investment firm of Arthur Perry and Company, Boston, Mass., writes: "At the Graduation Exercises of the Class of 1933 (comprising 595 boys and girls) of the Newton High School, Margaret S. May was presented with the Girls' Senior Cup, which is awarded annually by the Newton High School Alumni Association to that girl senior who, in the combined judgment of the pupils and the faculty, is outstanding in character, personality, athletics, and scholarship. She is now a freshman at Smith College, one of the 91 in that class who are Smith College granddaughters; that is, daughters of Smith College graduates."

D. K. Bullens' daughter, Peggy (Charlotte Margaret), entered Vassar this fall. Bullens is President of the New England Auto Products Corporation, manufacturers of universal joints and drives for automotive, marine, and power transmission requirements, located at Portstown, Pa. Bullens also has a son, Denison K., Jr., now about six years old.

Chet Dawes, Associate Professor of Electrical Engineering, Harvard Engineering School, writes: "I notice in the



1909 Continued

October Technology Review the whereabouts of the children of some of our notable class members are given and that you desire information concerning the youngsters of some of the rest of us. My son, Laurens, graduated from Exeter in 1931 and is now a junior at Harvard, living at Leverett House along the river. Father's career as an engineer does not seem to have impressed him and therefore after graduation he plans to attend the Harvard Business School. My daughter, Jane, is spending her third year at Abbot Academy, Andover, preparing for college. She has another year, but has not as yet decided on the college. She is attempting to find one where she can learn a lot without much study.

"I have not seen any members of the class lately, but have recently corresponded with Albert Thornley, who does a fair business keeping the Dawes family supplied with tennis racquets. I am looking forward to the Twenty-Fifth Reunion. Although, to be perfectly frank, I do not feel that old." — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. PAUL M. WISWALL, *Assistant Secretary*, 250 Park Avenue, New York, N. Y. MAURICE R. SCHARFF, *Assistant Secretary*, Main and Company, 1 Wall Street, New York, N. Y.

## 1910

As I may have remarked before, if you want letters from classmates to appear in The Review, classmates have got to write them. Perhaps this system of making a special appeal to ten men each month makes all the rest of the class feel that they are not called upon to write, so that if nine out of the ten appealed to fail to come through, the grist is small.

We are grateful, however, to H. R. Perry for saving this number from being a complete flop by the following letter he wrote us from Swarthmore, Pa.: "With average experiences over a period of years still trying to find out what is the hardest way to get rich and retire. The bad years did not hurt us over much and I am cheering with all of the rest of us for better times. I never see any of Course III. Are they still miners and dug in? Ray Jones, Paul Hopkins, Bill Hargraves, Dutch Wohlge-muth, Curtis Webb, and many more — do you have any news of them?" — DUDLEY CLAPP, *Secretary*, 40 Water Street, East Cambridge, Mass.

## 1911

Our sympathy certainly goes out to Royal Barton, VI, of Mountain Lakes, N. J., in his great bereavement through the loss of his wife this summer. Those of us who were at the Twenty-Year Reunion up here at Douglas Hill remember her pleasing personality and vivacity, and she and Royal and their son, Henry, seemed to enjoy every minute of the reunion.

Royal writes that his mother is helping him keep his family, one boy and two girls, together and his boy is now a freshman at Rutgers University, whence he can frequently make the 40-mile trip home for weekends. He is enrolled in the elec-

trical engineering course and is interested in orchestra work, being a fine pianist. In closing, Barton says he is still in the rate department of Electric Bond and Share Company, 2 Rector Street, New York City, where he is always glad to see classmates in the Big Town.

While on the Bartons, it is interesting to record that Don Barton, XII, came East a while ago from Houston, Texas, to spend several weeks with his wife and daughter and to take in the International Geological Congress in Washington. He has been making a study of salt dome overhang in the Barbers Hill field, Texas, and feels that such overhang can be successfully predicted by use of the torsion balance.

While at the sub-Freshman Camp last September, just before school opening, a youngster made himself known to me as Gordon Wilkes, Jr., M. I. T. 1937. He won the informal 50-yard dash in the camp track meet and is a fine youngster from all appearances. Saw his dad, professor of heat engineering, at a tea at President Compton's house in mid-October in honor of Jerome Hunsaker '12 and his wife. Many of us remember Hunsaker in the Annapolis transfers of our time and his choice to succeed Eddie Miller as Head of Mechanical Engineering seems most fortunate.

Still on the way up, R. E. Heine Zimmerman, IX, who has been assistant to the President of the United States Steel Corporation, New York City, has been made a Vice-President of the corporation and will interest himself in research and technology. For several months now he has been directing the company's preparations for activity in steel house construction and recently completed a new technical handbook for the assistance of fabricators of U. S. Steel products. An orchid to you, Heine!

Again a short story, mates. Help make it longer next month — write to Dennie! — ORVILLE B. DENISON, *Secretary*, Douglas Hill Inn, Douglas Hill, Maine. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

## 1912

C. A. Duyser, XI, has been located in Winsted, Conn., between construction jobs. He writes: "Since I last wrote you I had a job building the Memorial Bridge at Aurora, Ill. A picture of it appeared in *Engineering News-Record* a while ago. Just now I am doing some maintenance work for the Winsted Insulated Wire Company. Observations that I have made in this town indicate that the NRA program is working. Practically all of the industries have increased their working forces and the local paper reports a considerable decrease in the number of families who are being aided by the town." Duyser's present address is 261 North Main Street, Winsted, Conn.

Your Assistant Secretary reports that in spite of the depression and the numerous requirements of two small children, he still has about \$20 of Class money, which Shepard left in his care after the great Twenty-Year Reunion. Inasmuch as

McGraw-Hill has just restored 10% to the much-mutilated salary scale, your Class money may be safe for a while longer. If anyone would care to add a dollar or two from time to time to this fund, it would make a nice starting place to build for our Twenty-Five Year Reunion in 1937. — FREDERICK J. SHEPARD, Jr., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York, N. Y.

## 1913

Very little correspondence has crossed the Secretary's desk and very little class gossip has leaked in through the telephone.

One important item consisted of an announcement of Gil Pardey's wedding at Berkeley, Mass., early in the fall. Mr. and Mrs. Pardey are to live in Teaneck, N. J. The best wishes of the Class go to them. — Effie Macdonald Norton is now located in Boston, having transferred from New Haven. She dropped into the Institute one day, but unfortunately we happened to be out.

Ran into Dick Cross downtown the other day, and he told us that Gene Macdonald was in town. Conversation indicated that Macdonald was quite enthusiastic over the fact that his firm had landed the engineering work for the new government railroad bridge over the Cape Cod Canal.

A squib from some mining news forwarded by Professor Locke reads as follows: "Alan H. Means, of Salt Lake City, manager of the Yankee Mines Company in American Fork Canyon, is actively developing the southern end of the Alta ore zone, being guided by a geophysical survey recently made. Gold-silver-copper ore of good grade has been shipped."

We have had correspondence recently with Arthur Hirst concerning some technical matters. Hirst, after many years in Fall River with the print works, is now located in Providence as agent for the Carbic Color and Chemical Company, Inc. This is in Hirst's line, since this concern handles aniline colors and dye-stuffs. Hirst is also on a technical committee for a group of chemical colorists, doing research work on printing pastes.

It is with much regret we include portions of an obituary notice: "A. Russell Atwater, executive engineer, formerly connected with engineering firms in Boston, Detroit, Indianapolis, and New York, died at his home early in September. He was 44 years old. He died from concussion of the brain, received in an accidental fall at his home. Two family physicians, who were house guests, were in attendance."

"Born at Pittsfield, Mass., he was graduated from the M. I. T. in 1913. During the War he was stationed at Washington as an adviser on textiles for the aviation division of the United States Army. — He leaves his widow, the former Conway Lilley of Indianapolis; a son, A. Russell Atwater, Jr., 13; his mother, Mrs. Louis Lombard of New

1913 Continued

York City; and two sisters, Mrs. Thomas Allen, 3rd, of New York City, and Mrs. Raymond Menhard of Greenwich."

We had the biggest surprise of our life when who should blow breezily into our office but one Jack Farwell. We have not seen Farwell since graduation, but there has been no change in outward appearance — not even a gray hair. After having spent some years in France, he is now located in Brooklyn, N. Y., as President of the Sperry Products, Inc., and the Sperry Rail Service Corporation. His chief efforts, now, are to interest railroads in the use of the Sperry rail-testing apparatus. Jack, like your Secretary, is still a "gay and young" bachelor. He likes his work very much and promises to drop into the Institute more often.

Ken Hamilton called the other day, but unfortunately we were out. He left the original manuscript of Dr. MacLaurin's address, mentioned in the October issue of *The Review*. — ARTHUR L. TOWNSEND, *Secretary*, Room 3-435, M.I.T., Cambridge, Mass.

## 1914

Early this fall your Secretary chanced upon an unusually attractive rock garden. On stopping to admire it, he learned that it had been designed by none other than Donald Des Granges. Apparently Don has been devoting some of his architectural training to landscape work.

Harry Wylde, who is one of the group responsible for the operation of Lever Brothers' Hammond, Ind., plant, was in Cambridge recently visiting the Lever Brothers plant there, at which plant he was formerly night superintendent. Between Wylde and Boggs Morrison, our class is well represented in the executive staff of the Lever Brothers organization.

The number of letters coming in regarding the reunion next June is still painfully small. Every member of the class undoubtedly realizes that the running of a reunion next year is going to be a very difficult proposition. If this reunion is to be successful, it must represent the general wishes of the majority of the class and be so planned that an appreciable number can attend at a very small expense. Please let us have your suggestions in order that we may make arrangements according to your desires. — HAROLD B. RICHMOND, *Secretary*, 30 Swan Road, Winchester, Mass. GEORGE K. PERLEY, *Assistant Secretary*, 21 Vista Way, Port Washington, N. Y.

## 1916

When in New York this past week, I had the pleasure of having luncheon with Bill Farthing and Walter Binger. Even though new construction is absolutely dead in New York City, both Bill and Watt were found to be exceedingly cheerful. Bill is busy with the numerous reorganizations of properties under his Houston management. It seems that all real estate is to be subject to a code and Bill was busy with his slide rule figuring out what the fair return should be for unoccupied New York real estate (try and get it even though it may be fair).

Watt Binger reported that he has been quite busy all through the depression until last summer. When he did become quiet, he went up in the Adirondacks for a good, long vacation and now feels like a fighting cock. — Dick Ahern is working for the Western Waterproofing Company in the New York district. The report is that he is doing very well.

I hate to be prodding the class but I do wish a few of the boys would take it upon themselves to drop me a line and tell me about themselves. There has been a great scarcity of class news the last few months. — HENRY B. SHEPARD, *Secretary*, 269 Highland Street, West Newton, Mass. CHARLES W. LOOMIS, *Assistant Secretary*, Bemis Bro. Bag Company, Memphis, Tenn.

## 1917

The Dean went to the Fair and spent a night with E. P. Brooks of the U. S. Steel Corporation, whose home address is now 18 East Hickory Street, Hinsdale, Ill. He had intended to be a guest for a longer period but Mr. Brooks was suddenly called to New York. The Dean had time enough, however, to find the new executive of the Steel Corporation much interested in his work and in the possibilities ahead of him. Lobby also reports that he saw Ray Brooks in New York recently and found him still conducting the flying laboratory for the American Tel. and Tel. Company. A temporary difficulty with his hearing system has kept him on the ground for a time but he is still carrying on most interesting work.

Don Tarpley wrote that he had had luncheon with Paul Gardner in September during which J. Paul disclosed that he had been made curator of the new Kansas City Art Museum.

As this issue goes to press, announcement is received of the marriage of Miss Eileen Isabelle MacLeod of Inverness, Scotland, to the aforementioned Dean Harold E. Lobdell. The marriage took place on November 11 at the Fifth Avenue Presbyterian Church, New York City. — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

## 1918

In mid-October the faculty assembled with their usual academic dignity to pass on recommendations for various degrees. Among others, our own John T. Norton, sometime Guggenheim fellow, was recommended for the degree of doctor of science. Unhappily, John was not present to vote for himself.

Owing to the Secretary's being at Yale every Monday, Richard H. Smith has obligingly agreed to substitute as Class Representative on the Alumni Council. He will find it a stimulating and happy experience.

Letters from the boys continue to come in with contributions for the William P. Ryan memorial fund, and sometimes, even in these uncertain days, they contain checks for very substantial amounts.

A document addressed to Jeean T. Chang, 12 Ligolau Hutung, Peiping, China, in June came back the last of

October covered, we suppose, with the Chinese equivalent of "Return to sender. No such person at this address." But the thing which was most mystifying was the long wavy sticker also appended and upon which in meticulous Chinese characters is some oriental story, perhaps a history of the Chang dynasty, perhaps anti-Japanese propaganda. We couldn't find any method of satisfying our curiosity. Exposure to the local laundry man brought forth only, "35 cents please." — F. ALEXANDER MAGOUN, *Secretary*, 4-136, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, Wilson Road, Rowayton, Conn.

## 1921

Once more the holiday season is almost here, this time with ever-increasing indications of bigger and better reasons for good old holidays as of yore. May the New Year bring you full realization of all your fondest wishes, not the least of which, we hope, is a too-long suppressed desire to write to your Secretaries and share your news with the rest of the Class.

Leading the news parade this month is a most welcome communication from Glenn E. Fargo, 519 Williams Parkway, Denver, Colo. Says Glenn: "Not having reported any news since graduation, perhaps I owe you a line. I should like to report the birth of a second son, Lewis Floyd, on April 19, 1933. My first son, Glenn Edmund, Jr., has now passed his second birthday. My position is that of General Merchandise Manager of the Denver Dry Goods Company. You might be interested to know that, when I was in New York last, I ran into Frank Blewer at a theatre. He lives on Park Avenue and is still with Chase-Harris-Forbes." Many thanks and hearty congratulations, Glenn.

Professor Locke now reports that H. E. (Rolling Stone) McKinstry, who journeyed to the Transvaal early this year, has recently gone to Melbourne following his return from South Africa. Hugh will spend several months in Australia carrying on geological examinations of gold properties in various portions of the Commonwealth. How about an exclusive story of your travels for these columns, H. E.?

We are happy to present article No. 3 in the Boston *Transcript's* series entitled "Who's Who and Why?" which says: "There are few city employees in Boston that put in 12 hours of active work each day, seven days a week. One of these is Albert Lovell Edson, the Park Department's superintendent of the Boston Municipal Airport. If you want to keep a-pace with him some day, you'll have to be at the airport at eight o'clock in the morning and be prepared to stay until eight in the evening and sometimes close to midnight. The active charge of the huge expansion program that is under way on filled-in land at Jeffries Point has been Albert L. Edson's lot since the city took over the airport from the State.

"Though he is only 40 years old, Edson holds the rank of Captain and is operations officer of the 101st Observation



1921 Continued

Squadron, Massachusetts National Guard, in addition to his municipal assignments. Captain Edson enjoys airport construction and engineering — to say nothing of airport management. A graduate of the M. I. T., he is married and has two air-minded children.

"Beginning his flying career at Ellington Field, Texas, during the World War, Captain Edson drifted into commercial aviation in the last decade and has molded his combined commercial-military background into a statue of understanding. Reports have it that he plays as good a game of bridge as he flies. And that's saying quite a bit, since more than one person has said, 'If I can't fly with Edson today, I'll wait until I can.'"

"The *Transcript* really gave Captain Edson his start at the Boston Airport, since it contributed its office at the old T airport as the first administration building. Edson returned the compliment when the city erected the present Administration Building by setting aside a special room for the press, with desks, chairs, hat racks, and a full view of the field. If there is one mind today that can visualize the Boston airport of the future, it certainly is Albert L. Edson."

Q. What is the National Recovery Act? A. Federal aid to resuscitate Class Secretaries who receive voluntary contributions of news as a result of appeals in these columns! Merry Christmas and a very Happy New Year! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, South Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N. J.

## 1922

Although your Secretary has hoped from month to month that there would be a number of letters from members of the Class giving information regarding themselves and others that we all know, none has been received. The Alumni Office has been good enough to forward a number of newspaper clippings and some supplementary information which has come to their attention in various ways.

We note that E. D. Martin was elected President of the National Battery Manufacturers' Association at the annual meeting in Cleveland last fall, and that at the spring convention in Louisville on May 1 and 2 he delivered an interesting Presidential address.

Thomas Stubbs reports that he missed attending the 10-year Reunion because he was being married at that time. He is continuing his work with the Lehigh Navigation Coal Company, making his headquarters at Lansford, Pa. He has been in touch with Dick Bard, and occasionally hears from J. O. Bower, who is connected with the Geological Department of the Texas Oil Company.

Alison Hemingway Hatch married Hiram Hamilton Maxim in Hartford on June 3. Hiram is active with a company that bears his name, and is making his home in Hartford, Conn. — Elizabeth Warrington Hartel and Danny Coogan were married in West Newton on June 4.

After spending their honeymoon in Bermuda, the Coogans returned to their new home at 22 Evergreen Avenue in Hartford.

Marjorie Alice Davidson and Colver Dyer were married in Winchester in June, taking a wedding trip to California by way of the Panama Canal and returning overland through the Canadian Rockies. Dyer is a chemical engineer and is making his home at 33 Kenwin Road in Winchester. — On August 5 Edith Endicott Young married Dave Harris. Their future home will be at 8 Bonwood Street in Newtonville.

We give the new residences with the hope that some of their friends will find the information valuable in getting in touch with the new benedicts.

R. P. Russell is General Manager of the Hydro Engineering and Chemical Company, and of the development division of the Standard Oil Development Company.

We regret to announce that Herbert Cobb died early in October. He had been employed as a chemical engineer by the Allied Chemical Company and was living at home with his parents. All members of the Class will join in extending sympathy to Mr. and Mrs. Cobb.

When this issue of The Review reaches you in December, won't you pre-date the new year and send a few jottings to me regarding your activities? They will be gratefully appreciated and will, I know, be welcome to many of your old buddies. Heinie joins me in sending our best wishes for very happy holidays to all. — RAYMOND C. RUNDLETT, *Secretary*, Curtis Publishing Company, Lincoln Building, 42nd Street, New York, N. Y.

## 1923

A few items stand between your Secretary and a complete lack of news this month. H. C. L. Miller, Jr., II, whom I last bumped into at the desk as he was checking out and I was checking in at the Roosevelt Hotel, New Orleans, writes me that he has been transferred to Cleveland. He was Assistant District Manager for the Foster Wheeler Corporation in Philadelphia, and at Cleveland he will be District Manager, so the transfer carries a promotion with it. He explains: "I have been with these people since 1926 in various capacities, starting with research and design work in the engineering department in New York, thence to Philadelphia as resident engineer, and now out here. The company designs, builds, and installs all sorts of equipment for industrial and public utility power plants and oil refineries, so there is considerable variation in the work."

There are also reports from a couple of Course XV men. Leslie W. Powers, for one, is Special Agent for the National Liberty Insurance Company of America, with office at Newark, N. J. — Bill Upham is the other who writes from Florida: "My residence has been in St. Petersburg for the ten long years since we graduated. I should have probably gotten up to our reunion this spring had I not been expecting an addition to my family

which came this week, in the form of a little girl, Natalie Janeway Upham. I also have a little boy who will be three years next week. Have been in the real estate business since graduation. Our firm (The Upham Company) does a general real estate business. Lately we have added a bond department, being licensed under the Florida Blue Sky commission, and dealing largely in Florida municipal and county bonds. I have been Treasurer of the St. Petersburg Realty Board for the last two years and chairman of its Real Estate Appraisal Committee."

The young lady whom most of us remember as Gladys Farmer, V, married a Harvard man, Laurence Edmund Noble, and they are living in Enid, Okla., where he is in the oil business. The important information I have about her is that she has a daughter who will be nearly a year old by the time these notes appear. Her name is Barbara and she was born November 27, 1932. — HORATIO L. BOND, *Secretary*, 195 Elm Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, Room 661, Eleven Broadway, New York City.

## 1925

Your acting Secretary wishes to apologize for the absence of notes last month; he was away on a belated vacation at the time the notes were due at the Review office.

In glancing over an old letter of Frank Klein's, I find the following paragraph, which I give in the hope that it will be news to most of you. "By the way, I happened to discover that Frank Fricker is with the engineering laboratory of the Ethyl Gasoline Corporation at Detroit, with whom we (Materiel Division of the Air Corps) have considerable correspondence, and so on."

The Review Editor lent us a letter from Geoffrey Roberts, IV, from which I take the following excerpts, under the address of Johannesburg, South Africa, where Geoff is now located: "I have seen Glen Bateman several times since I have been here. He is a little heavier than in his days at Tech, but he looks very fit. He is doing well in business, of course. I imagine his father's firm has been one of the fortunate ones in these times of depression. Glen was married last spring to a South African girl, I believe. He is very active in flying circles, a member of the Johannesburg Light Plane Club, and one of the few local people who have their own plane. — I have met one other Tech man here, Thomas, '29, XV. I understand that Jeppe is still in America. So far as I know, I will spend the rest of my days in South Africa. I was born in Rhodesia. My family moved to America when I was a year old. I have more relatives in Africa, though. After 18 months of unemployment in California, I decided to come out here and start life all over again. I have been in Johannesburg three months now and still have not been able to make a permanent connection, but I imagine something will crop up in time."

Professor Locke sends us the following note: "Mrs. Andrew Myer (née Edith Chartkoff) sailed for England on July 21,



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and will join her husband, Andrew Meyer, in the Russian gold fields in the Urals." — Myer Shacat, X, is working for United Chromium, Inc., Waterbury, Conn.

Dr. George V. Slottman, X-B, who was connected with the United Steel Companies, Ltd., of Sheffield, England, has returned to this country, and is living in St. Albans, L. I., N. Y. Valentine Harrington, V, is married, and I understand has one child, but I am not certain of the latter, and would welcome a communication from him checking this, and giving his address, which I have not in my files at present. — HOLLIS F. WARE, *Acting Secretary*, 16 Smith Avenue, Reading, Mass. HENRY V. CUNNINGHAM, JR., *Secretary*, 43 Chestnut Street, Boston, Mass.

## 1926

Items for this social register are so lamentably scarce this month that your Secretary feels impelled to adopt the technique of the levitating White Queen. As you recall, she remarked to Alice that "it is a poor sort of memory that only works backwards." Having nothing to report about things that have happened, we resort to a record of things that happened the week or month after next: the ovation, for example, accorded Dave Shepard for the way he played the part of Ariel in the amateur performance of "The Tempest" next January; or the lead pencil mine Bill Millar discovered next summer; or the novel scented fish glue our big glue-and-ink man, I. R. Macdonald, discovered for Carter's Ink next April; or the auction in Washington of the Capitol grounds for building lots engineered by Mooney Owen next June; or the comic opera with its setting in Wall Street staged by Bean Lambert during the coming Lent; or how Doodle-Bug Gleason discovered a geophysical technique for locating lost '26 men; or the number of engagements, marriages, and births piled up by the Class in 1934. Further resort will be had to this interesting device if more news is not available next month.

Of past occurrences we have been apprised of the following: On October 7 Miss Virginia Kimball of Lynn was married to Howard Humphrey. After assisting in Course XV for a year after graduation, Howard took up the trade of doctoring businesses and he now has a shingle "Management Consultant" hung out. — A visitor from Troy, Ohio, recently brought the news that Patricia Frisbie now has a swaddling sister, Mary. — E. M. Myer is with Porcelain Products, Inc., Parkersburg, West Va. — Ralph Hammar is with General Electric's Patent Department. While in the Washington office, Ralph studied patent law and was admitted to the bar. — Bob Richardson is doing sales engineering in Maine for Ethyl.

In a recent letter to that patron saint of class secretaries, Professor Charles E. Locke '96, A. F. Horle, mining engineer of Oaxaca, Mexico, included the following observation on his lieges, the Za-

potecs: "Most of the people are indigenous Zapotec Indians of whom there are several hundred thousand in the state. The larger percentage of them are entirely illiterate, less than 10% of my workmen being able to read or write. A good many of them have but little knowledge of Spanish and in order to explain things to them it is often necessary to use an interpreter. I have been trying to pick up a smattering of the language, but since they have no written language, and the words seem to me to be hardly more than guttural sounds, with practically no construction with each other, the problem is quite difficult. These Indians religiously, not necessarily piously, observe all the saints' days that they know, get very drunk on mescal, cry, dance, and yell all night, or better yet, two nights and the intervening day, work a week or two, and then do it all over again. (On thinking this over, I guess they aren't so much different than supposedly civilized people at that.)" The cynical note sounded at the end of this ethnological comment marks Horle as a budding sociologist.

We now turn you over to Ben Richardson, the Peripatetic, but not without reverting to the method of the White Queen by wishing on this pleasant day of October that you had a bountiful Christmas and that 1934 brought you all good things. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M. I. T., Cambridge, Mass.

## COURSE VI-A

The world is indeed a small place, as the following incident will bear out. In passing through the Seattle station to take a train back home, who do you believe was sitting on a bench? Bob Sherwood. Now, who would think of finding this Porto Rican in Seattle? As I walked over, taking a second look to make sure, it appeared that the conversation with the young lady by his side was an earnest one, so as soon as we had said hello and a few remarks, I shoved off after learning he was taking the same train. What luck! a companion for a tiresome journey.

We spent two days reminiscing, relating experiences since parting on graduation day, and contemplating the future. The latter seemed quite enticing to him because, as you may guess, his trip across the entire country was not just to renew his acquaintance with the Washington scenery, which he had lived in for a couple of years before being transferred to Porto Rico.

Bob is distribution superintendent of the Juice Utility on the island. It is a job taking ingenuity and planning way off there where manufacturers' supplies are not at beck and call. His experiences during the blow last year were very interesting, told as our train climbed through the Rockies. Right after the breeze had subsided enough to put one's head out from under cover, it was found that distribution just wasn't. For a day or two the large power plant on the side of the island that faced the brunt of the hurricane was operating to supply

juice for its own lights and a coffee percolator to keep the gang going on their tremendous task of building up what came down so fast. Mighty small outlet for such large capacity as the plant could supply.

So our journey passed quickly and pleasantly, parting company in South Dakota, where my itinerary took me off the beaten path. Meetings of this type are the spicy morsels we are occasionally allowed to enjoy with our classmates. — BENJAMIN P. RICHARDSON, *Secretary*, 3 Osceola Drive, Greenwich, Conn.

## 1928

This month we received a very fine letter from Gil Ackerman, who is now located with the Luchenbach Steamship Company at Pier No. 1, Seattle, Wash. The following remarks from this letter seemed especially interesting for this column:

"The last time I wrote you I thought I was settled in San Francisco for some time, but the third of July, they called me in the office and said I was to leave for Seattle as soon as possible, so we broke up our home in San Francisco and came up to Seattle, where I am Marine Superintendent and in charge of operations on Puget Sound for the ships. As we have all of the ships back in the Intercoastal trade, there is lots to do at times, but it is interesting, which makes the days fly by.

"Our second youngster was born this spring — Betty, we named her — though it should have been Pat as March 17 was her birthday. — I read with much interest the account of the first five-year reunion and how I envied those fortunate enough to be there. Believe me, if I hadn't been so darn far away from Boston, I surely would have come."

During the last week in October, your Secretary and Joseph A. Parks, Jr., whom you will remember as being our very prolific Course II Secretary, spent part of the afternoon and evening with George DeCamp and his family in Providence. George is working for the New England Lacquer Company after having transferred from the Gorham Company about two years ago. The New England Lacquer Company specializes in the manufacture of finishes for jewelry and tables. George has recently been given the job of Secretary of the company and he has just cause to feel very happily located.

It behooves us at this time to issue a warning for '28 men to watch out for Mr. Bill Kirk. Up to the time he attended the Harvard Business School several years ago, his friends have indicated that he was a very nice young man. Since that time, however, Bill has been taking poker winnings away from most of the Boston alumni and we, therefore, issue this warning to other men who might otherwise fall into the clutches of this card sharper. Messrs. Jope, Parks, and Hough are now conducting a campaign to force Bill into a position where he will have to promote a poker party at his own expense. They feel that in such a case there would be some protection for the

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customers, even if "Bo-Peep" should win. — GEORGE I. CHATFIELD, *General Secretary*, 420 Memorial Drive, Cambridge, Mass.

## COURSE I

"Here is some news from a Course XI man, Class of 1928. I was married in Yuma, Ariz., on October 5, 1933, after eloping from Pasadena, Calif., in my plane with Miss Melba Gorby, 26th woman in the United States to get a transport pilot's license for airplanes. My wife is a first-class technologist and an artist as well. We are extremely happy together and send love to the gang. Yuma is a quiet little desert town; try it some time."

That important news was signed Bill Beard. So once more congratulations are in order and we extend them to Bill and the new Mrs. Beard. His letter came from the California Institute of Technology, 1201 East California Street, Pasadena. — GEORGE P. PALO, *Secretary*, 426 East 238th Street, New York, N. Y.

## 1929

It is with sorrow that I report the death of Waldo M. Powers, IV, on October 14, 1933. The Class extends its expression of sorrow and sympathy to his family.

The engagement of Allen Congdon, IV, to Miss Alice C. Tobie of Portland, Maine, was announced in the *Boston Transcript* of September 16, 1933. He attended the Institute as a freshman in Course IV, and is now studying at the Harvard School of Architecture. — The marriage of David Graham, VI G, to Miss Clover Henry of Scarborough-on-Hudson, N. Y., in London early in September was announced in the New York papers. They will live in London, where he is in the London branch of the J. Walter Thompson Company.

Last November Herman Meisner, X, eloped with Miss Dorothy Butler of Wakefield, Mass., and they kept it a secret for almost a year, or until after he had completed his course in business administration last June. The announcement was made September 21, but it did not disclose whether his business administration was at the Institute or not. According to the announcement, they are to live at 333 East 43d Street, New York City.

Much happiness is wished each of the above couples. If my records were only complete, I should like to furnish you a figure on the percentage of the class that is still numbered among the benedicts, but I'm sure my records would not produce a true figure, for every once in a while I hear of someone in the class who has been married for some time and we never received notice of it.

Joel Whitney, II, just wrote in a grand letter disclosing the fact that he is no longer an insurance salesman, but is now working as an engineer foreman for the State Forestry Department of Tennessee in the Citizen's Conservation Corps Camp in McKenzie, Tenn., about 115 miles from Nashville. His daughter rated a whole big paragraph in his letter and we

learn that she is now almost walking and talking and has reached the ripe old age of 15 months.

How about some of you other proud fathers stepping up and giving us the story of your children's accomplishments? Not having any myself, I can't start the ball rolling, so someone else will have to do it. It would be fine if it were possible to discover some subject of common interest that would create a little enthusiasm among you to write a few lines on the subject occasionally. Last year I quoted a couple of fair golf scores and I didn't even hear any doubts expressed. I wish I could post a pair of better scores this fall and it would probably start a discussion, but I can't even quote a pair of 73's this season. — Let's have your thoughts regarding our Five-Year Reunion next summer. — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

## 1930

## COURSE VI-A

Wanny appears to be set on maintaining his record of writing two letters to my one. More power to him. He is working in the laboratory of the Sun Oil Company at present, determining octane ratings and other things which seem equally mystifying to me. He is getting to be quite a cook. Let me quote him on his method of preparing that delicacy known as broiled chicken: "I simply whacked the thing in two and took out all the inside working parts and then broiled each half."

I spent a very pleasant week-end with George Schaible and his wife not long ago. George is struggling manfully with the problems encountered at the intermediate distributing frame in one of the central offices in Albany, N. Y. We were able to congratulate each other on the raises which we both were glad to receive from the New York Telephone Company recently.

Prendy was visiting Philadelphia a short while ago and reports that Ray Bowley is nursing a slightly smashed finger but is otherwise enjoying good health. He also relates a story worthy of Baron Munchausen concerning his defeating of Frank Burley at tennis.

John J. Molloy writes me that he has taken up house painting in a big way as a result of the Huntington Avenue tunnel having fallen through. John was with the Boston Transit Department for a time after graduation. — EARL E. FERGUSON, *Secretary*, 60 Eaton Place, East Orange, N. J.

## 1932

## COURSE III

There is little this time except some notes that were cut from the October Review referring mostly to our department in Cambridge in which, Professor Hutchinson stated in a letter last August, there have been a few changes. The course in Ceramics, together with its personnel, Professor F. H. Norton, has been transferred to our department for administrative purposes. A new branch

library has been organized and has gone into the rooms immediately opposite Dr. Waterhouse's office on the third floor. It is a larger room than before, and will combine geology, mining, metallurgy, and ceramics. A new librarian, Miss Warren, trained for the work, is in charge, and all was in order by the middle of August.

As far as personals are concerned, there is little to add. Keskulla stopped in here in August on his way to Utah to go to work for the U. S. Smelting Company at Midvale, Utah, in their lead refinery. He reports the work very interesting and instructive. They started him off on the job of firing. All the firemen have to do is keep all the furnaces and kettles in the refinery at their proper temperatures and to alter them to suit the process. Hence, he gets taken into all parts of the building and witnesses all stages of the different processes. Good work, Kes. I'll bet by now you do not regret a winter in the mountains of California. Let's hear some details when the opportunity presents itself.

Haynes reports he is still alive. Not only is he alive but, as he puts it, is "running a small business with another fellow making up and selling lists of prospects for oil burners and various kinds of fuel." Mediocre success so far. Cheer up, Still, winter is coming, but do not come out here with any oil burners. One flivver is plenty just at present.

It is with regret that we announce the passing of Miss Oakes. She died, according to Kes, who told me, some time last spring from cancer. I know we are all sorry to hear it.

Please note the new address of the Secretary who would appreciate its being used very much. — HENRY J. CHAPIN, *Secretary*, 59 North First Street, Duquesne, Pa.

## COURSE X

This welcome letter arrived in time for the scanty notes of this issue. As you will guess when half way through, it is by one of our leading funsters, John Crowther, whose address is 801 East Lorena Avenue, Woodruff, Ill. More real news like this would certainly liven up our little column; how about it, fellows? — C. M. Chase, *General Secretary*.

"Herewith report news of X men collected in past three months: Rub Rash is getting to be a big shot at Lambert's gargle works and won the club championship at Osage Country Club in Kirkwood, Mo., where he is living. I chisel a roost out of him about twice a month. — Semple is happily settled with his new frau and still with Monsanto. Connubial bliss distracts him from collegiate contacts.

"Letter from Potts down in New Jersey. He is running a soup plant for du Pont, having a swell time from reports. Says if he makes a mistake with the mixed acid he may drop in on me, bit by bit. Anderson is with Standard of Louisiana, but I don't know where.

"I quit (believe it nor not) my Wisconsin paper mill job on June 4; O. R. C. Camp Custer, Mich., June 15-30, where I



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met several Tech men, through Chicago and the Fair to Wood River, Ill., where after three weeks of competition by various industrial firms, I blushing accepted an offer from Shell Petroleum, whose biggest refinery is here, just across the road from Standard of Illinois. I am the only M. I. T. man in these parts. After a little assorted pipe fitting, brick-laying, and so on, to get the smell of hydrocarbons in my hair, I was transferred to slipstick pushing, where I now am. But, boy, am I using that old Bible!

"Jerry Kellogg, of Military Science fame, has a brother in our St. Louis office who is his twin. This is a god-forsaken place; I can't even find a lodge brother and any Sigma Nu will tell you how common us Betas are." — WILLIAM A. KIRKPATRICK, *Secretary*, 35 Orchard Street, Portland, Maine.

## 1933

Ed Goodridge was up to see me last night and said if he had it to do over again, he would take Course XV. What a difference four months out makes to these Course VI men — of course, he has the right idea. After an interesting summer with the Metric Association in Pottsville, Pa., Ed is now getting organized in the electrical business. He intends to go in for equipment to flash electric signs.

Word comes from Pennsylvania that Bill Miller is selling vacuum cleaners. We also hear that Bill has recently become a "proud father." Congrats, Bill!

Ed also told me that Bob Dillon and Colonel Cashman were on a pretty swell camping trip this summer. Bob is now back at the Institute on that scholarship he won last June and the Colonel is working at Hood Rubber. We understand that Bob is also sporting a new car which he received as a gift.

Wally Shaw, one of our former Course XVII men, has been having a busy time since leaving us last year. He was installing weather-stripping for a while and the latest dope is that he is working with Armour Engineering. Wally is also active in the National Guard here in New York. Besides these he is going to Brooklyn Polytech evenings. — Jack Andrews is home from Europe and from what he says he surely had a fine time while over there. He didn't miss many places.

As this is the December issue, may I extend the season's greetings to all of you. — GEORGE HENNING, JR., *General Secretary*, 163 Barbey Street, Brooklyn, N. Y.

## COURSE X

The comical engineers seem to have this here now depression by the tail. Over 70% of the boys are either taking graduate work or fast becoming wage slaves.

First, those who have returned to their first love. The following are at the Practice School in Buffalo, working and studying at the Lackawanna Steel Plant, and leading the life of Riley at the Buffalo University Club: Cirker, Glenn, Kressman, Freeman, Lobdell, and Partridge. At the Institute we have Bob Dillon, on the Thorpe Fellowship; Ike Levovich,

Al Parker, who worked all summer with the Lewis Mfg. Company in Walpole; Bob Rossi, assisting Doc Lewis; Frank Twomey and Ed Walsh. The last heard of Larry Kingsland was that he intended to enter law school this fall. Quite a few are now valuable assets to their respective companies. Colonel Cashman is with the Hood Rubber Company in Watertown, Mass. Les Lockman is puttering in the research lab of the Angola Chemical Company, New York City. Court Marshall is down in Beaumont, Texas, with the Magnolia Petroleum Company. Art Mason is keeping the water soft in the Farr Alpaca Company, Holyoke, Mass. Cal Mohr is with du Pont Rayon in Buffalo. Al Munson is on his uncle's ranch in Harrison, Idaho. Bill Rand is in the research lab at Dennison's, Framingham, Mass. Bob Smith is in the Defender Photo Company of Rochester. Walter Swanton, the traitor, is a *civil* engineer, on dam design with the U. S. Reclamation Service in Denver. Dave Treadwell, Jersey's most prominent nudist, is working for the United Piece Dye Works of Paterson. Fran Vaughn is doing research for the du Pont Company in Wilmington. Last, but far from least, Mort Williams is in the Technical Service division of the Sun Oil Company, Marcus Hook, Pa. — WILLIAM E. RAND, *Secretary*, 273 Union Avenue, Framingham, Mass.

## COURSE XIV

A rather incomplete account of the seniors of this Course is available. All members of the Course were written in sufficient time for replies, but only two of the six responded. The obvious conclusion to be drawn is that four have been either kidnapped, exceedingly lax in answering letters, or perhaps a job in a foreign country has fallen to them and their reply has not yet had time to reach the land of coming prosperity and NRA.

John Sbrega is at home closely watching two good prospects for jobs. Mike Chiminello is likewise unemployed, but has prospects and odd jobs to keep him busy. Both of these men are finding time to catch up on reading which was so sadly neglected for the past four years.

I am working in a very small electrochemical plant which is a subsidiary of the Althouse Chemical Company. The work is development and large-scale research for the most part, I mean large-scale research more in the sense of size of apparatus than extensiveness. There are only two men, myself and a fireman. The work is mostly with dyes and I challenge the class of '33 to show a job that will leave a greater stain. — OTTO A. PUTNAM, *Secretary*, Althouse Chemical Company, Reading, Pa.

## COURSE XV

Five months out and what a lot has happened! In the first place our wandering nomads, Sam Prescott, Ed Wemple, Ellis Littmann, Lewis Stone, Jim Vicary, Fred Murphy, Dave Nason, Bill Jones, and Jack MacBrayne, '31, have come back from Europe. Sam Prescott writes: "We were gone about nine weeks altogether,

and got into France, Belgium, Holland, Germany, Czecho-Slovakia, Austria, Italy, Switzerland, and England. In all, we visited about 30 plants, and covered about 5,000 miles on the bus. I certainly enjoyed the trip, and if the other fellows enjoyed it and got as much out of it as I did, it must have been worth while. I suppose I could mention lots of interesting episodes, but if I ever got started on that, there is no telling when I'd stop. A few of the high spots were the first week in Paris, the champagne factory in Epernay, our reception by Mr. Schaurte in Dusseldorf, the breweries in Rotterdam and Prague, the Hofbrau House in Munich, the beach at Lido, Italy, the trip through the Swiss Alps, and the boat trip back, not to mention our more serious visitations."

While we are on the subject of traveling, it seems that the World's Fair in Chicago has been responsible for a lot of it among the fellows. The registration files read like a class roll. Such a list would be far too long to put in here.

Old Man Depression seems to be taking a back seat the way jobs are showing up. Ed Lloyd writes that he is holding down a desk in the engineering department of the Washington Gas and Light Company and in between times helping Roosevelt run the country. Chuck Thumm is working for his father, as is Ellis Littmann in St. Louis. Our Secretary, George Henning, is also doing the same when he is not up at Columbia working on his master's degree in metallurgy. George is in a fair way toward becoming a salesman. He says, "Send me an order sometime." Is that Course XV training?

Leighton Richards writes that "owing to my Mother's illness, I have remained at home, refusing a number of opportunities with New York concerns." Ed Wemple is back at M. I. T. finishing up and Lew Stone, at the last report, had finished his thesis and was going to work with a needle company in Connecticut. Sam Prescott says he has done nothing more serious than go sailing with Chuck Thumm in Wisconsin while on his jaunt out to Chicago and the Fair. Charlie Case is going to spend the coming year studying at Cambridge, England.

That rounds out most of the latest dope except for myself and I am in the Production Department of the Keeler Brass Company here in Grand Rapids, Mich., and have been here since the middle of the summer.

It is my intention to maintain a card file of the latest addresses of all of you for your own convenience in locating one another. It should be of some value to you if you are making any kind of a trip to know who is located on your route. I hope you will keep me posted as to your address changes. For most of you, all I have at present is the home address. — FRANK LOPKER, JR., *Secretary*, 607 Atwood Street, N. E., Grand Rapids, Mich.

## COURSE XVI

Our protégé, G. P. Bentley, has been in Hartford all summer in the experimental department of the United Aircraft and



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Transport Corporation. Now he is back at M. I. T. doing research on vibration in aircraft. He is going to treat us to a few rare bits in the club *Sixteen Bulletin* which will be forthcoming in the near future. — Howie Sargent is in Hartford with the above-mentioned concern as a test pilot. As he says, "When investigation involves flying, I am supposed to be the goat."

If any of the gang want Eddie Foster's latest story (the one about the Empire State Building) they can have it by merely sending me a self-addressed stamped envelope. (It's three cents this time.) Eddie has been working in a First National Store to kill time this summer. As Eddie says, "I've been refused employment by some of the aero industries' best companies."

The Edward G. Budd Company in Philadelphia has been kind indeed to Course XVI. Bill Sheppard, Clare Forr, Gus Martin, and Danny Davis are all on the active payroll. Davis is designing dies for auto body stampings. The rest of the boys are doing stress analysis, I gather. Bill Sheppard says: "Gus Martin, Clare Forr, and I stood with heads bowed for a minute day before yesterday (Registration Day at M. I. T.) in silent prayer, as a tribute to a life that's gone but not forgotten."

After a trip to the World's Fair and an extensive job-hunting campaign, Frankie Der Yuen met with success at the Glenn L. Martin Company in Baltimore. During his spare time, Frankie is flying with the Maryland National Guard. In Frank's words, he is "still single with one son at Yale!"

Sam Goldstein and Sulo Pasnonen are both in Quincy, Mass. Sam is working with his brothers in the used car and parts business. Sulo says he is "chief cook and bottle washer." I don't know whether he means for himself or somebody else.

Charlie MacNeil took the vows last month in Malden. The girl is Elise Melish. Charlie is in the stress analysis department at Curtiss Wright in Buffalo. Good luck, Mac! — Dick Molloy is Westwood's Jack-of-all-trades. He's making pocket money, but that's liable to mean most anything. Dick tells me confidentially that he's going to take Tubby Roger's advice if he can find a boss with a daughter.

Albert M. Patterson, Pat to us, is Course XVI's European correspondent. Pat is traveling all over Europe bicycling, hunting, sight-seeing, and who knows what else?

Mike Sampas is A.C.C.C. officer located in the Fitchburg woods. His rate of climb  $\left(\frac{dy}{dx}\right) = 0$ , whatever that means.

Here's to you, Lieutenant. — Ben Smilg has written me a doleful letter, telling me what a cheerless summer he has had at Coney Island and environs. Now he's back at Tech investigating the effect of tail length and size on stability (airplanes, of course).

Johnny Wiley says, "I have no job, no girl — much less a wife — and, I sincerely hope, no dependents. However, the prospect is good, at least for the first of the above mentioned."

As for yours truly, he's trying to keep the infamous wolf from the door by

reading gas meters and selling Plymouths (advertisement). Ruthie sends her regards to Course XVI. — FRANK K. MACMAHON, Secretary, 168 Pleasant Street, South Weymouth, Mass.

## COURSE XVII

It's appalling how the correspondence fell off. Not a word except from Neil, and he's still in New York. Suppose all the rest are working at least 15 hours a day and cannot find time to dash off reams and reams of letters. Don says that Professor Tucker's article in *The Review* was excellent and that it would be nice to have things that way in New York, but sitting there in his window he gazes out at great piles of stone and meditates on how it will be one long, long time till anything much is done.

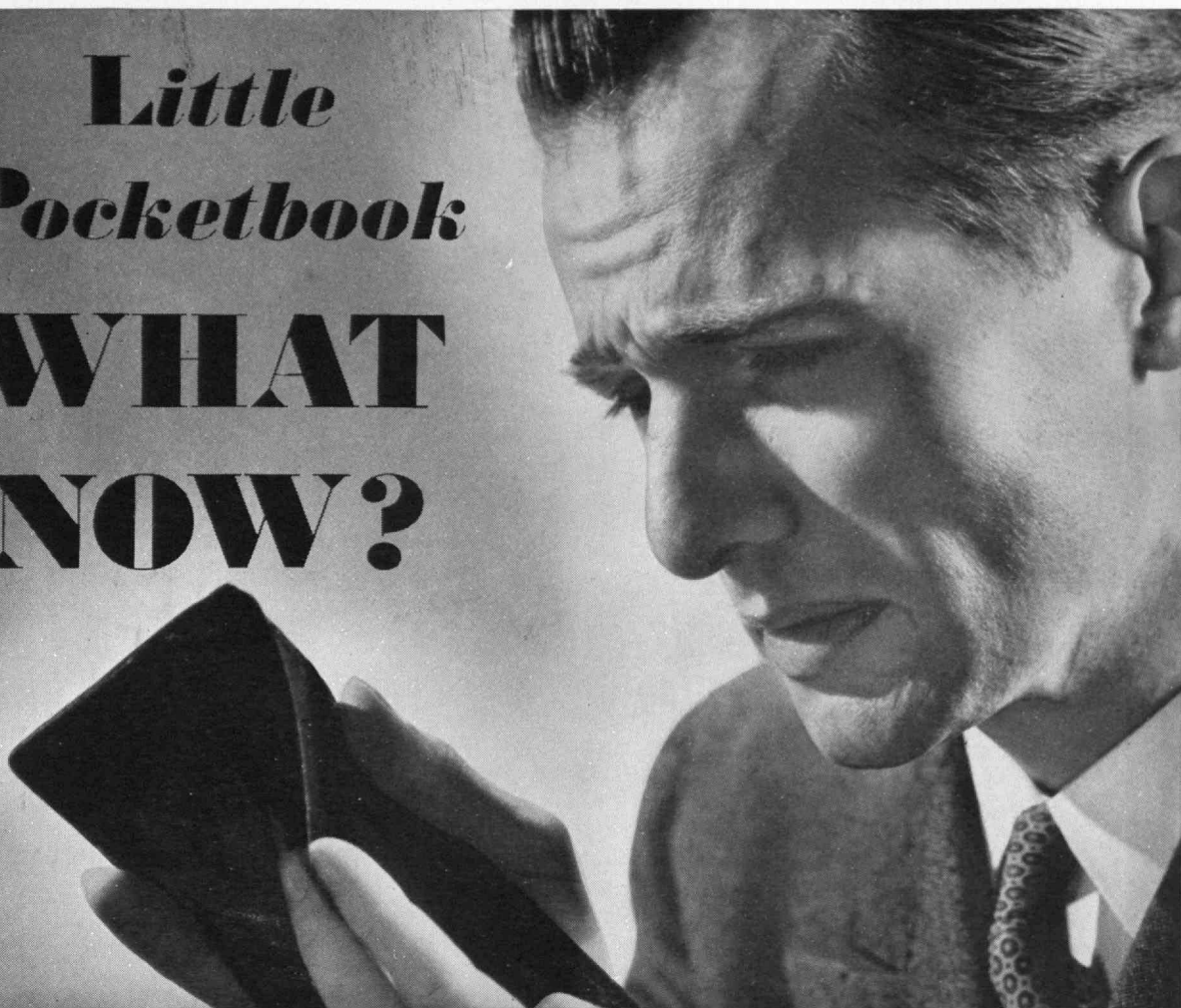
If anyone gets to the big city, drop in on Neil. He sounds so sad and lonely there all alone. But I wonder if he really is so all alone at that? There's a certain way with the women that he possesses.

Don't I have the laugh on the boys in Boston. It's still warm here and I can almost get through work before it gets dark — come on down boys and enjoy the Southern climate. Cannot speak of the Southern women, for the work keeps me too busy; honest, it does.

Professor Tucker dropped a line in which he asked that suggestions to improve the course be sent in. Now all the kicks about XVII can come home to roost. It's an open invitation, boys; so do your worst.

Seems that this is all we can eke out this time. — BEAUMERT WHITTON, Secretary, Box 431, Charlotte, S. C.

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